THE
LARYNGOSCOPE.

VOL. XLIV DECEMBER, 1934. No. 12

SYMPOSIUM ON FACIAL NERVES.

I.—PRICKLE CELL EPITHELIOMATA OF THE EAR WITH INVOLVEMENT OF THE FACIAL NERVE IN THE TYMPANUM.*

DR. WARD C. DENISON, New York.

The carcinomata are tumors composed essentially of epithelium, although they, like other tumors, are supported or surrounded by a vascular stroma which they exact from the neighboring tissue. Carcinomata may be placed in the following groups, namely:

1. Squamous or Flat Cell Cancers: These arise in the skin, esophagus, etc., or wherever there is stratified epithelium, and are known as epitheliomata.

2. Basal Cell Cancers: These arise chiefly in the skin, but analogous tumors are found elsewhere. They are relatively non-malignant and are the basis of the so-called rodent ulcers.

3. Cylindrical Cell Cancers: These are analogous to the polyps or polypoid adenomata of mucosae which have glands lined with columnar epithelium. They retain the tendency to form gland-like structures, lined with cylindrical epithelium and are hence called adenocarcinomata.

*Read as part of a Symposium before New York Academy of Medicine, Section on Otolaryngology, March 21, 1934.

Editor's Note: This ms. received in Laryngoscope Office and accepted for publication, April 30, 1934.

4. Cancers derived from Acinous Glands.

Prickle cell epitheliomata belong to the squamous cell type. Microscopical sections show that the tumor is made up of strands of a typical stratified epithelium showing all the characters of those seen in cutaneous cancers. The cells are held together by very distinct intercellular bridges (prickle cells), and undergo keratinization (MacCallum: A Textbook of Pathology, 3rd edition).

Malignant tumors of the ear are extremely rare and according to Robinson, only one case of new growth occurred in 4000 cases. Fraser reports 13 cases of malignancy of the ear in 6600 cases of external and meatal infections at the Royal Infirmary. Most of the cases are epitheliomatous, only 25 per cent being of the basal cell type. Broders reported 61 per cent of epitheliomata were squamous cell, 33 per cent basal cell type and five per cent melanotic, out of 63 cases of malignant tumors.

Carcinomata often develop from seborrhoeic keratosis, frost bites, eczema, trauma, and chronic mastoiditis.

Case 1. M. O., female, age 69 years, white, Russian, was admitted to the New York Eye and Ear Infirmary on Dr. Craig's service, with a clinical diagnosis of O.M.P.C. left, prickle cell epithelioma of the canal and a left facial paralysis.

Present Illness: Intermittent otorrhea of the left ear for the past ten years. During the past three months the patient had had severe pain in the left ear region with frequent headaches. Whenever the patient attempted to clean the left canal it bled freely. There had been a left facial paralysis for the past week.

Past History: Appendectomy seven years ago. She had been troubled with a stomach disorder and hypertension for several years. She had had vertigo and vomiting attacks during the past year.

Physical Examination: Elderly female, poor color, fairly well nourished, complaining of severe pain in the left ear. Blood pressure 196/124. Eyes: Pupils equal and reacted to light and accommodation. Nose: Dry mucosa, atrophic changes. Mouth: Dry mucosa, tonsils diseased, teeth extracted. Neck: No abnormal pulsations, palpable glands on right side of angle of jaw. Chest: Heart sounds regular in

rate and force, no extrinsic sounds. Lungs normal, no rales. Abdomen: Relaxed musculature, no points of tenderness, no rigidity. Old appendectomy scar. Neurological reflexes normal. *Evident weakness of left facial nerve. Unable to close left eyelid. Slight deviation of tongue to the left.*

Ears: Right ear appeared normal. Left ear showed a moderate foul purulent discharge from the middle ear. Most of the drum was destroyed with granulations protruding through. In the canal on the superior wall was a cauliflower-like mass about the size of a pea which bled very freely when manipulated or probed.

Laboratory Findings: Blood count: Hemoglobin, 88 per cent; R.B.C., 4,664,000; W.B.C., 11,750; Polys., 65 per cent; Lymphocytes, 34 per cent; Transitionals, 1 per cent. Urine: Acid, specific gravity 1018, no sugar, no albumen, no casts, no acetone or diacetic acid.

X-ray of Mastoids: Right normal, left marked sclerosis.

Biopsy of Growth from Left Canal: Nests of prickle cells were present with hair follicles running through the tissues. There was a tendency toward pearl formation.

Diagnosis: Prickle cell epithelioma.

Operative Procedure: A left radical mastoidectomy was performed on April 10, 1931. The usual posterior incision was made. Upon removing the cortex a very soft spongy necrotic bone was observed. There was a large, firmly attached sequestrum which involved the entire mastoid tip and hypotympanum. Just below the horizontal semicircular canal was an exposure of the facial canal with necrotic soft tissue present. Upon removing this the facial nerve was seen. It was swollen to about three times its normal size and had a cauliflower appearance. The nerve was dissected free to its exit, at the stylomastoid foramen, and above to its entrance in the middle ear. The middle ear was filled with necrotic granulations and cholesteatoma. A large meatus was made and the cancerous tissue excised. A large area of dura was exposed when the necrotic plate was removed. No exposure of the sinus was made.

Postoperative Course: Following the operation the temperature rose to 102° (rectal). It gradually came down to

normal on the third postoperative day and remained normal during the remainder of her stay in the hospital. The patient complained frequently of severe pain in the head. This was relieved by codeine and aspirin. The facial paralysis seemed to remain the same as before the operation.

The skin clips were removed on the fourth postoperative day. The skin margins were very blue and necrotic in appearance. The tissues began to slough and the wound was left wide open. Wet boric acid dressings were applied and the wound healed by third intention. The canal discharged freely of pus. The wound was dressed daily. Her general condition seemed to improve. The posterior wound gradually healed, but there was a profuse discharge from the cavity. She left the hospital on May 9, 1931. On June 2, 1931, she had a radium treatment of 50 mgm. for 20 hours. Since that time she has failed to return for treatments and I am sorry that I cannot report the final results.

Conclusion: Prickle cell epithelioma of the ear seems to be an extremely rare disease. The patient had had an otorrhea of the left ear for the past ten years. When she was first examined in the dispensary, three weeks before admission to the hospital, a foul odor to the discharge was noted with very small granulations protruding from the middle ear. There was no apparent involvement of the canal wall by cancerous tissue. During this time the polyp became enlarged and the canal wall was involved with cancerous tissue; also the facial paralysis developed. Thus it is shown that the cancerous growth progressed very rapidly in three weeks. I think the otologist should have a biopsy of every polyp removed from the ear, no matter how innocent it may appear, and advise a radical mastoid whenever dealing with a chronic mastoiditis of long duration and complete excision of the cancerous growth immediately, later to be followed with radium treatment.

REFERENCES.

1. MacCallum: A Textbook of Pathology, 3rd Edition.

2. Robinson, G. A.: Malignant Tumors of the Ear. The Laryngoscope, July, 1931.

3. Broders: Transactions of American Otological Society, xv, 1921.

4. Hunter, Tod: Diseases of the Ear, 2nd Edition.

20 East 53rd Street.

SYMPOSIUM ON FACIAL NERVES.

II.—OTITIC HYDROCEPHALUS, WITH REPORT OF A CASE.*

DR. CLARENCE H. SMITH, New York.

Symonds[1] has given the name of otitic hydrocephalus to a condition characterized by the symptoms and signs of increased intracranial pressure, including swelling of the optic discs, occurring as a complication of otitis media, without the existence of a cerebral abscess.

Passot[2] has described the condition at length. Mygind[3] cites 15 cases. Cairns[4] reports three cases. Carmack[5] describes two cases.

Otitic Hydrocephalus is more common in children and adolescents than in adults.

It may occur as a complication of acute or chronic otitis media with or without mastoiditis.

On postmortem there is found a congestion of the choroid plexuses and an edema of the ependyma and subependymal tissues. There is an excess of cerebrospinal fluid in the subarachnoid space and in the ventricles. Whether the hydrocephalus is due to increased formation of cerebrospinal fluid or to decreased absorption of cerebrospinal fluid, or to a combination of both these factors, is at present unknown.

On lumbar puncture the cerebrospinal fluid is characterized by its clarity, its large amount and increased pressure. Microscopically and chemically the fluid is normal.

The symptoms are those of increased intracranial pressure. Headache is one of the most constant symptoms. It is of the bursting type and is promptly relieved by lumbar puncture. Papilloedema is another common symptom and may be of

*Read as part of a Symposium before New York Academy of Medicine, Section on Otolaryngology, March 21, 1934.

Editor's Note: This ms. received in Laryngoscope Office and accepted for publication, April 30, 1934.

severe degree. This may advance insidiously to secondary optic atrophy and blindness. Nausea and vomiting are uncommon. Temperature and pulse rate are normal. Drowsiness may be present, but sometimes the mental state may be remarkably clear. Occasionally hemianopia, aphasia or hemiparesis is present.

The evolution of the symptoms may be insidious or they may develop after a preliminary phase of fever and cervical rigidity suggesting a meningitis, the meningitic symptoms subsiding as those of hydrocephalus develop.

The course of the illness may be protracted to weeks or months, but leads towards complete recovery.

There may be a sequel of impaired vision from optic atrophy.

Although in some cases recovery appears to have been spontaneous, the rational line of treatment is drainage of the excessive cerebrospinal fluid by lumbar puncture, repeated to meet the indications, which are recurrent headache or persistent papilloedema. If repeated lumbar puncture fails to relieve the symptoms, ventricular puncture should be undertaken.

Where localizing signs are present a brain abscess may be suspected, leading one to explore the brain. A point of distinction is some increase of protein and almost always an increase of cells are present in a brain abscess.

George M., age 20 years, entered Morrisania City Hospital, Aug. 29, 1933, complaining of a severe throbbing frontal headache and a discharging left ear. His ear symptoms were of two weeks' duration: pain, discharge, tinnitus. He had headache for five days, vomiting for three days, fever for five days without chills. On admission his temperature was 105° F., the respirations were 34. The patient felt very uncomfortable and tossed about his bed violently.

Examination: There was a slight purulent discharge from the left ear. There was no mastoid tenderness. His pupils were dilated, they were equal and reacted to light and accommodation. There was a bilateral papilloedema of one diopter with dilated and tortuous veins. The disc changes were more marked in the left eye.

There was nuchal rigidity. There was an absence of the patellar reflexes on both sides.

On lumbar puncture his spinal fluid showed a pressure of 38 mm. Hg. There were 30 cells to the cmm. The chemistry of the spinal fluid was normal.

Course: Two hours after the lumbar puncture the cephalalgia disappeared and the respiration rate became normal. On the sixth day, bilateral positive Kernig reactions were noted. He ran a septic temperature for six days.

On the eighth day he showed mastoid tenderness, the aural discharge ceased, the posterosuperior bony canal wall drooped. A simple mastoidectomy was performed. Considerable necrosis was present. The sigmoid sinus was found exposed for about 3 cm. It was thickened by added layers of exudate and granulation tissue. The healing of the mastoid wound was rapid.

Eye Signs: For six weeks postoperatively the patient showed mydriasis and papilloedema. Papilloedema was constant, this ranged as high as two D. There was no exudate or hemorrhage. The left eye was always more affected than the right. The papilloedema gradually lessened. On his discharge the fundi were normal except for some haziness due to the prolonged papilloedema.

Spinal Fluid and Manometric Studies: Prior to the mastoidectomy lumbar puncture showed as follows: There was a persistent increase in pressure. The fluid was clear. Cells were from 40 to ten in a cmm. At first the polymorphonuclears predominated, later the lymphocytes were more numerous. The sugar and chlorides were normal. The globulin ranged from a slight increase to normal. The globulin-albumen ratio was not reversed.

On three different examinations of smears from the spinal fluid, a few gram positive diplococci were found, the same type as appeared in the aural discharge. These did not appear on culture. This would suggest, according to Dr. Neal, who kindly saw the patient, but did not check up the bacteriological work, an organism so devitalized that multiplication was restrained.

The neurologists brought out an interesting point in the use of the Ayala Spinal fluid index. This index is the sum arrived at by multiplying the final pressure by the amount removed and dividing this by the initial pressure. Ayala claims that this index is high in serous meningitis, above five, and lower, below five, in increased intracranial pressure due to brain tumor or other obstructive processes. The Ayala index in this case was over ten. In a recent case of proved temporosphenoidal abscess the index was 3.6.

After the mastoid operation the spinal fluid was normal in every way except that lumbar puncture, performed every 48 hours, showed an increased manometric pressure. This increase, far above normal at the outset, gradually receded until the normal pressure of 12 mm. Hg. was reached.

Blood cultures were persistently negative.

After the mastoidectomy to the date of discharge on Oct. 11, six weeks later, the patient felt extremely well, with absence of any symptom. The eye signs already referred to were the only evidence of persisting trouble.

Therapeutic Measures: Lumbar puncture daily or every other day was performed. In all, 22 lumbar punctures were made. Glucose solution was given intravenously and magnesium sulphate was administered orally.

Comment: The signs of meningitis, the increase of cells in the spinal fluid, previous to the mastoidectomy, were probably due to protective meningitis. After the removal of the infective focus the normal spinal fluid, save for the increased pressure with the consequent papilloedema, point to otitic hydrocephalus.

BIBLIOGRAPHY.

1. Symonds, C. P.: *Brain*, LIV, 55, 1931.

2. Passot, R.: *These de Paris*, Paris G. Str., 1912-13.

3. Mygind, H.: *Jour. Rhinol. and Otol.*, 37, 597, 1922.

4. Cairns: *Jour. Laryngol. and Otol.*, 45, 385, 1930.

5. Carmack, J. W.: *Annals Otol., Rhinol. and Laryngol.*, XLII, 364, 1933.

140 East Fifty-fourth Street.

SYMPOSIUM ON FACIAL NERVES.

III.—A SIMPLE SURGICAL METHOD OF DEALING WITH SALIVARY CALCULI IN THE SUBMAXILLARY DUCTS.*

DR. AUGUST L. BECK, New Rochelle.

Salivary calculi are not every day occurrences, but are seen fairly frequently in a busy practice. There are two principal types of lesions where there is present a calculus in the submaxillary duct. In one type, which may be termed an early stage, obstruction is not complete, and therefore there is no cyst formation behind the stone. In the other type, one of much longer duration, there is complete obstruction by the stone with resulting cyst formation and with well marked changes in the duct walls. More or less infection with or without suppuration may also be present.

The excision or removal of a calculus from a salivary gland duct can be either a simple, easily accomplished procedure, or a most exasperatingly difficult, tedious and messy experience to both patient and physician. The following procedure applies to the submaxillary (Wharton's) duct, but the principle is applicable also to the duct of the parotid gland. No unusual or specially devised instruments need be used. It is particularly applicable to small calculi where there has been no cyst formation.

Up to the point of removal of the calculus the one procedure is applicable to both types. Nothing further is necessary when dealing with the first mentioned type, but with the second it may be advisable or necessary to suture the mucosa of the duct to the mucosa of the floor of the mouth, converting the duct into an open channel or trough. In some extreme cases it may be advisable or necessary to excise a portion of the duct wall before suturing as above mentioned. The procedure is not recommended for the removal of a calculus in

*Read as part of a Symposium before New York Academy of Medicine, Section on Otolaryngology, March 21, 1934.

Editor's Note: This ms. received in Laryngoscope Office and accepted for publication, April 30, 1934.

the submaxillary gland tissue. In such a condition removal of the calculus alone or of the entire gland through an external neck incision is the rational procedure. Where a cyst or ranula is a large one, direct incision and more or less complete excision of the cyst walls is the obvious procedure.

Blair[1] states that the most common location of salivary calculi is in the submaxillary duct, being more frequent there than in all other locations combined. They form more frequently in the excretory ducts than in the glands themselves.

Czygan's report[2] of 37 cases of salivary calculi corroborates Blair's statement: Wharton's duct, 22; submaxillary gland

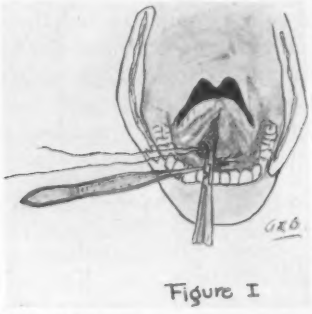


Fig. 1. Method of introducing the traction sutures.

tissue, four; Stenson's duct, five; parotid gland tissue, one; sublingual duct, four; Bartholini's duct, one; total, 37.

The detection of a calculus in the submaxillary duct is usually fairly simple, but at times may be difficult. It should as a rule be demonstrable on a radiograph because of the presence in it of lime salts. History of symptoms and examination by palpation should demonstrate its presence, but until it has become large enough to cause some obstruction the patient may not be aware of any abnormality in the mouth. Discomfort or pain, and swelling, particularly when eating, are the usual symptoms. To these methods of detection, probing of the duct by the method about to be described can be added. Probing the duct, for detection of a calculus, I have found most easily accomplished by grasping the tissue be-

neath the papilla with a pair of delicate conjunctival forceps, after which a small size Bowman lacrymal probe is readily passed. If there is any difficulty in getting the end of the probe into the orifice it may be first dilated with a conical canaliculus dilator.

Cyst formation or ranula may result from the obstruction caused by a calculus in the sublingual or submaxillary ducts,

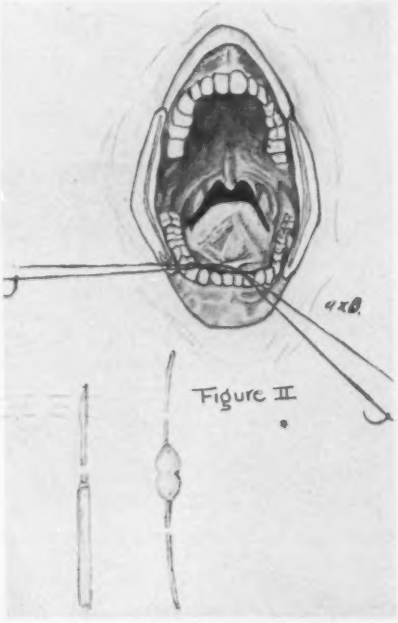


Fig. 2. Traction sutures in position. Note slit shape of orifice.

and therefor calculi should be sought for and removed when the cyst receives its surgical attention. There may, however, be no calculus formation in these cysts. It is also conceivable that a calculus may form secondarily in a cyst as a result of stagnation. If found, it should be removed when the cyst is opened, and the cyst walls dealt with as indicated. Partial removal of the walls, and suturing of the remaining part to the adjacent mucosa of the mouth floor usually results in cure.

REMOVAL OF CALCULUS.

One of the chief difficulties in the removal of a calculus is due to the fact that the tissues lie loosely in the floor of the mouth, making it difficult to handle or manipulate them accurately. The difficulties are largely overcome if the parts can be immobilized at will while the work proceeds. This immobilization is accomplished by means of silk traction sutures temporarily placed for the duration of the operation. Grasping the tissue close to and beneath the papilla with small for-

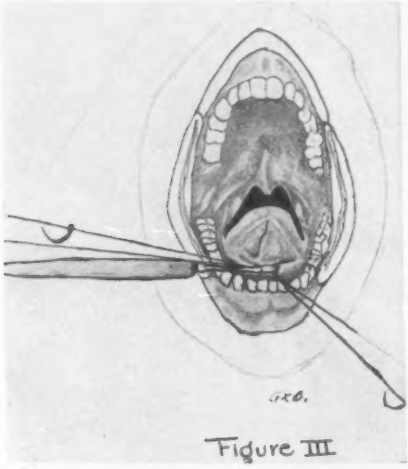


Fig. 3. Canaliculus knife in position for slitting of duct.

ceps, one suture is placed on each side of the wall of the duct through its orifice as snown in the drawing, and given to an assistant, who exerts counter-traction, converting the small orifice into a fairly large slit. At the same time this traction brings about immobilization of that submaxillary gland duct and lifts the duct away from the floor of the mouth. The sutures may be held by an assistant or may be conveniently hooked around the teeth, at the point of emergence from the mouth.

With the duct orifice thus held in position, a Bowman lacrymal probe is passed for detection of the calculus, after

which a Bowman canaliculus knife is inserted and the duct slit open far enough to expose the calculus. At a depth adjacent to the calculus it may be necessary to complete the slitting with scissors. When thus exposed, removal of the stone is not difficult.

Some calculi are smooth and can be easily removed by grasping with suitable forceps or by tumbling them out with a strabismus hook, ring curette or other suitable instrument. Other calculi have a rough irregular surface and are more

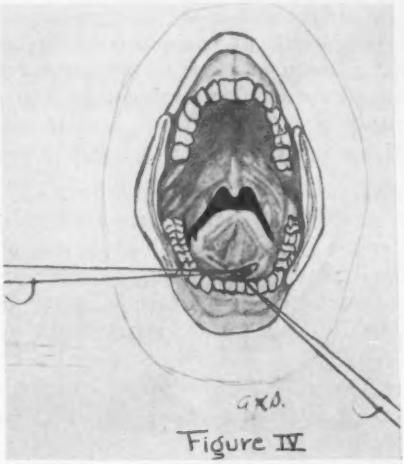


Fig. 4. Appearance after duct has been slit open, exposing calculus.

or less fixed in the soft tissues. These cannot be tumbled out, but must be cut loose from the soft tissue bed. This I do preferably with scissors, being particularly careful when working on the tongue side of the duct.

A Bowman lacrymal probe has been found to be very well adapted for probing the duct, and the ball-pointed Bowman canaliculus knife for slitting the duct. The ball-pointed canaliculus knife can be relied upon not to make a false passage in the duct. To me this slitting has been much easier than cutting down on the duct directly.

I have found the ophthalmologist's instruments, *viz.*, eye needles and silk, the Bowman lacrymal probe, Bowman canaliculus knife, conjunctival forceps, straight and curved eye scissors, strabismus hooks, etc., very useful for this purpose. In excising a calculus from this duct, it is important to avoid the tissues on the tongue side (posteromesial) of the duct. The ranine artery, lingual vein and lingual nerve are located between the duct and the tongue. Working on the anterior or mandibular side of the duct avoids all of these important structures. Suturing of the wound after the removal of the calculus, I consider unnecessary, except where fluid has accumulated in cyst formation, in which case it may be necessary to suture the lining mucous membrane of the duct to the adjacent mucous membrane of the mouth floor in order to avoid subsequent stagnation with recurrence. All of my operations were performed under local anesthesia with the patient sitting in a chair. Gentle suction in the hands of an assistant is a great convenience while working.

At the Massachusetts Eye and Ear Infirmary, Doctors Harris P. Mosher and M. H. Lurie[3] have been using a method similar in principle in dealing with these calculi, but differing in that the immobilizing suture or sutures were placed deeply in closer proximity to the calculus, thus making it possible to cut directly down upon the calculus.

BIBLIOGRAPHY.

1. BLAIR, VIBRAY PAPIN: Surgery and Diseases of the Mouth and Jaws. Mosby, A., 2nd ed., p. 415, 1914.

2. CZYGAN: (Breslau Clinic), quoted in Keen's Surgery. Saunders, W. B., & Co., Vol. III, p. 323, 1912.

3. MOSHER, HARRIS P., and LURIE, M. H.: Personal Conversations, Jan. 12, 1934.

421 Huguenot Street.

THE PRESENT STATUS OF DIATHERMY OR ELECTROCOAGULATION IN THE TREATMENT OF TONSIL DISEASE.*

DR. EDWARD R. ROBERTS, Bridgeport, Conn.

It is only recently that the idea of septic absorption and foci of infection have played such a great part in therapeutic medicine. Until then, from the standpoint of the end result, the tonsil had been attacked only as an enlargement, and the treatment was by slicing off the redundant part with an instrument called a guillotine or tonsillotome, although evulsion of the tonsil was recommended by Hippocrates as early as 460 B.C.[1] and the finger dissection technique dates back to 10 A.D. However, this excellent advice appears to have been lost sight of for centuries as the guillotine for tonsillotomy was not designed until 1827 by Physick, of Philadelphia.[2]

In the search for septic foci, it was soon found that tonsillar crypts were often offending sources, and the partial operation of tonsillotomy was entirely inadequate, as it left the most harmful part of the tonsil, namely, the base of the crypts, and did not result in any improvement in health. Thus the demand immediately arose for total removal, and tonsillectomy by one method or another became the operation of choice.

Nowadays anything short of a complete tonsil removal is not to be considered. It is essential to remove thoroughly every piece of tonsil tissue, thus insuring the eradication of every piece of crypt. It is only in this way that the tonsil as a septic focus can be eliminated. There is a fund of evidence in support of this statement.

Of late years, with the increasing exploration of radiation in all its forms, it was discovered that the X-rays and the gamma rays of radium would diminish lymphoid tissue. Attempts were made to use these on the tonsil as a curative

*Read before the Bridgeport Medical Society, Nov. 7, 1933.

Editor's Note: This ms. received in Laryngoscope Office and accepted for publication, May 24, 1934.

source but with no good effect, and even at times with positive harm. Partial atrophy would take place but infection still remained, so these methods were abandoned.

At a later date, the idea of coagulation by electricity was developed, as a means of destroying malignant growths, not amenable to ordinary surgical measures, and it was not long before this method was suggested as a means of attacking the diseased tonsil.

This idea of electrocoagulation or surgical diathermy as it is called, was elaborated by the manufacturing firms who developed and placed on the market a suitable apparatus for its application.

Ushered in by clever advertising and marketed by good salesmanship, and later by the Life Extension Institute, who are advocating its use,[3] there arose a public demand for this form of treatment utterly out of all proportions to its merits, so that in the interests of both the public and the profession, it seems essential to review the facts, as ascertained by impartial investigation.

Claims are made that electrocoagulation makes for a relatively safe, simple and practical method, an office procedure rather than a major surgical operation, and substantial elimination of secondary hemorrhages, material reduction in postoperative pain, avoidance of secondary infection, trauma, edema, scar tissue, general anesthesia, loss of working time, hospitalization and savings incident to operating room and anesthetists' fees.[4]

That these claims are extravagant will be obvious from the information which will follow.

With the principles involved in surgical diathermy you are likely familiar. Briefly, it depends on the fact that a high frequency current, when applied to tissue under proper conditions literally cooks it. Current flowing between electrodes of unequal size creates an increasing degree of heat, as it approximates the smaller electrode. With the use of a needle electrode with moderate current, heat is dispersed throughout a pyramidal shaped area, base toward the proximal end of the needle, as the needle increases in its diameter toward its attachment. Such a setup used on the faucial tonsil through

a needle electrode as the active pole, plunged into its substance and the coagulating current applied, results in a coagulated area which in a few days sloughs away and the patient ejects or swallows that portion of his tonsil.

Repeated applications of such a current produces then pyramidal shaped areas of coagulation irregularly superimposed.

With the use of a bipolar needle, each needle is equally active and the arcs described by the current wave likewise coagulates an area pyramidal in shape but broader at its base.

These statements are plainly verified by the examination of a coagulated area, using this equipment on meat.

So uncertain is the location of the needle electrode when within the tonsil substance that one of two things must happen, either living tonsil tissue is left between the apices of these pyramidal shaped sloughs (admitting for the moment that the apex meets and stops at the tonsil capsule) or tissue destruction beyond the tonsil capsule becomes a fact, as coagulation takes place for an appreciable and uncertain distance beyond the needle point.

As Dr. Arthur Nilsen, Assistant Professor of Otolaryngology, New York Post-Graduate Medical School, Columbia University, points out, the difficulty is in destroying these definite adjacent sections of tonsil tissue. He likens diathermy attempts on the faucial tonsil to the taking of custard out of a cup with a spoon, it being practically impossible to get it all out without painstaking scraping because of the ridges and streaks that are left between the spoonfuls and here with the advantage that the spoon cannot penetrate or damage the structure of the cup as such a current can the tonsil fossa.[5]

One is advised never to turn on the current unless one sees and knows exactly where the needle point is; not to allow the area of blanching to extend beyond tonsil tissue as damaging the pillars will result in disagreeable complications; to avoid the possibility of overdoing; as one can always go back after more but destruction cannot be replaced.[6]

In this caution is the crux of the whole situation as it asks one to determine the dimensions of the faucial tonsil in all directions *in situ*, and then, coagulate only to its borders. The coagulated mass which results in the slough cannot

be determined in advance, certainly not to the thickness of the tonsil capsule or the wall of a blood vessel.

Complications now being reported include tonsillitis during period of operation; infection of tonsil remnants with scar tissue formation; pharyngeal and peritonsillar abscesses, destruction of pillars; edema of uvula, pillars and larynx; cervical adenitis[7] and cellulitis necessitating external drainage, through and through slough from pharynx to skin following external surgical incision for complicating cervical abscess, sepsis, erysipelas, diffuse furunculosis;[8] postoperative hemorrhage necessitating transfusion and emergency tonsillectomy.[9, 10]

Sharp secondary bleeding can only be controlled by immediate tonsillectomy. To waste much time in an effort to pick up a bleeding vessel in the infected necrotic coagulated mass of lymphoid tissue is dangerous. Nothing short of reaching the main trunk in the outer tonsil capsule layer will meet this emergency.

The diathermy advice is to recoagulate. Should this suffice at the time when the sloughing process repeats itself, the bleeding may likely recur.

It would appear that the reason why bleedings of this kind do not happen more often is because few attempts seem to be made to actually destroy all the tonsil.

Among conclusions drawn from work at the Clinic of Dr. George Shambaugh, Clinical Professor of Otolaryngology at the University of Chicago, are: that for tonsil and tonsil stumps diathermy is too costly in loss of time and discomfort; that secondary hemorrhages are difficult to control, due to tonsil frailability, and results have not accomplished complete removal of tonsils although treatment has been carried out over a number of months. This clinic has not seen a patient treated elsewhere where the tonsil fossa was free from tonsil tissue and it brands the statement, that partial removal will answer, preposterous, and emphatically condemns the ill advised explorations of diathermy through misleading statements in health columns of the daily press, and through notoriety seekers in the medical profession.[11]

Similar conclusions were arrived at through work done at the Clinic of Dr. D. H. Jones, Surgeon of the Manhattan Eye,

Ear, Nose and Throat Hospital in New York, where it was found very difficult to obtain the co-operation of the operators to continue such work as they became more disgusted and discouraged with the results, feeling that they never knew when they removed the tonsil completely.[12]

Tonsil coagulation in these clinics was done under the supervision and direction of representatives of the companies whose equipment they were using in order that this work would be done in the exact manner advocated by the manufacturers.

Dr. T. C. Galloway, Professor of Otolaryngology, Northwestern University Medical School, states that in several years of earnest effort to study all methods, and see all demonstrations staged in his vicinity, by reputed leaders of this technique, he has not found one method in his hands that has produced satisfactory results.

He feels that no hocus-pocus of electrical equipment can make a tonsillectomist and that diathermy is not an open sesame to large operative fees, yet that is just the idea one finds in the hopeful hundreds that crowd some of the staged demonstrations. He further states that he will continue to do operative tonsillectomies when tonsil removal is advisable, on older patients, on children, cardiacs and nephritics, with the feeling that one procedure usually finishes their trail with a minimum amount of hazard, and discomfort, with a belief that he has done his best to insure a complete elimination of a focus, any remnant of which is dangerous, with the least damage locally and to the organism as a whole.[13]

Dr. R. G. Brown and Dr. J. V. Duhig, *Medical Journal of Australia*, July 2, 1932, state that diathermy treatment does cause pain (in fact, many patients complain as much after its use as after the old cautery treatment, and it may even be as painful as tonsillectomy), that examination of tonsil remnants reveals abscesses and infection, and that general marked improvement follows surgical removal of tonsil tissue left after coagulation treatment.

Dr. Joseph C. Beck, Clinical Professor of Otolaryngology, University of Illinois, College of Medicine, early declared himself against the ability of the X-ray to cure septic processes in the faucial tonsil. He early took the same stand on this question.[14]

Severe hemorrhage complicating tonsillectomy after electrocoagulation is to be anticipated due to an increase in the number of blood vessels supplying the tonsil remnants, the result of this electric burn. The microscope further shows infected lymph follicles, inflammatory exudate and vascular thrombosis.[15]

These findings and experiences agree with the opinion of Dr. Robert Sonnenschein, Clinical Professor of Otolaryngology, Rush Medical College, who points out that with diathermy there is just as much danger of hemorrhage as after operation, not only that but the danger is present after each treatment so that a patient is liable to bleed, not only during the 10 to 12 day period as in tonsillectomy (which period in a practical way is only of a 24 hour duration) but for a similar period in each of as many as 20 treatments.[16] This number of treatments was thought necessary as early as June, 1931.[17]

Since this advice was given to the profession it has come to my attention that one reputable and painstaking operator now considers 60 applications of diathermy necessary before a result, satisfactory to him, can be brought about.

Conclusions: Contrary to the advice freely given by some, that surgical diathermy is the procedure of choice over tonsillectomy, the facts are that with the use of surgical diathermy:

Theoretically, the tonsil is not entirely removed and if my idea of the mechanics of this technique is correct, it cannot be. Practically, as most of us see end results, this is the fact.

The danger of secondary hemorrhage is great.

There is postoperative pain in the series of treatments.

Secondary infection, with edema, is always present in *some* degree, and scar tissue invariably is the end result.

Diathermy is unsurgical and dangerous in itself, and may be dangerously inefficient from the standpoint of the patient.

Additional surgical removal is necessary afterwards.

Tonsillectomy is, as yet, the only operation which adequately fulfills the demand for complete removal of the faucial tonsil and complete eradication of this organ as a focus of infection.

REFERENCES.

1. Loeb, H. W.: Operative Surgery of the Nose, Throat and Ear. St. Louis, C. V. Mosby Co., 1917, Vol. II.

2. Moore, I.: Tonsils and Adenoids. St. Louis, C. V. Mosby Co., 1917, 133-138.

3-12. Jones, D. H.: Personal Communication to Author.

4-6. Electrocoagulation of Tonsils. Liebel Flarsheim Co., pp. 2-4-5-6-21.

5. Nilsen, A.: Personal Communication to Author.

7-10. Jones, D. H.: The Laryngoscope, Vol. XLIII, March, 1933, pp. 231-232.

8. Scheer, H. M.: The Laryngoscope, Vol. XLIII, April, 1933, p. 303.

9. Woodward, H. B.: Personal Communication to Author.

11. Shambaugh, G. E.: *Trans. Amer. Triolog. Soc.*, 1932.

13. Galloway, T. C.: Surgical Diathermy in Tonsils. *Trans. Amer. Triolog. Soc.*, 1932.

14. Beck, J. C.: *Trans. Amer. Triolog. Soc.*, 1932.

15. Fowler, R. H.: The Laryngoscope, Vol. XLIII, April, 1933, p. 308.

16. Sonnenschein, R.: *Trans. Amer. Triolog. Soc.*, 1932.

17. *Archiv. Physiotherapy, X-Ray and Radium*, June, 1931.

144 Golden Hill Street.

SYMPOSIUM ON NEWER CLINICAL APPROACHES.

I.—NUTRITIONAL INFLUENCES.*

DR. WILLIAM WESTON, Columbia, S. C.

We assume that this group in common with all other members of the medical profession who are forward looking and keep abreast of progress in the etiology and treatment of diseases must necessarily be a student of nutrition. From the great mass of literature that has accumulated within the last few years, much of which represents long and scientific research and is, therefore, of great value, we may feel fully justified in joining in the conclusion reached by those who have expressed the conviction that food is the fundamental factor concerned in the health and efficiency of an individual and is the determining factor in civilization.

We have come to the realization that the activities on which the life of the body depends involve a continuous expenditure of energy and a constant exchange of material. Ultimately the body is dependent upon food for fuel material which supplies energy, for the substances which are transformed in the body and for those whose presence regulates and controls these transformations. The cells that compose the tissues and organs of the body are constantly dying and being resupplied. The average life of the red cells of human blood is 30 days and it is through the food we eat that they are replaced. These and other changes constitute metabolism; therefore, a normal metabolism depends upon the constituents of the diet. These must be adequate in all respects, because each element that composes the diet has definite functions to perform, and these functions are only performed through the metabolizing influences of other elements. This is true in regard to the fats, carbohydrates, proteins, mineral elements and vitamins. In other words, they are interdependent.

---

*Presented as part of a Symposium at the Annual Meeting of the American Laryngological, Rhinological and Otological Society, held at Charleston, S. C., April 3, 1934.

Editor's Note: This ms. received in Laryngoscope Office and accepted for publication, May 14, 1934.

We must think of the metabolism of matter and energy as essentially the same and when the food supply in any of its elements is absent or deficient, these changes must continue at the expense of the body supply. Should this substance become insufficient or exhausted, well-being ceases and disease and death inevitably follows. The course is so insidious that we are apt to lose sight of the true etiological factor.

It is essential that there must be maintained at all times a mildly alkaline reaction of the blood. McLester thus expresses this need, "for the maintenance of life and the proper performance of function, the cells must be surrounded by a medium that at all times maintains an interchanging reaction and fixed molecular concentration." Many of the products of metabolism are acid in reaction and consequently tend to alter the normal reaction. Carbonic acid and the acids of phosphorus and sulphur, and to a lesser extent other acids, which result from protein metabolism must be neutralized. This is accomplished by foods high in certain of the mineral salts as found in thin green leafy vegetables. The Jarvis group, nearly all of whom, I am informed, are members of this organization, have rendered to the medical profession most commendable service in having translated this knowledge into practical application. Their observation in regard to the altered and congested condition of the mucus membranes and the serious consequences following these conditions if uncorrected, I believe, is an accurate observation, and their suggestion as to appropriate dietary treatment is both logical and effective.

Several years of work at the South Carolina Food Research Laboratory has brought to the attention of students of nutrition the variability of the chemical content of fruits and vegetables grown in different localities and soils, and of milk from cattle fed feeds differing in their chemical content.

We have analytical information of fruits and vegetables grown and milk produced in each county in South Carolina. Similar information should be available for every locality in the United States. When this information is available, we shall know the best sources of supply and will then be in a position to prescribe diets upon a more scientific basis. We trust that this group who have manifested such great interest in the problems of nutrition and who have made such out-

standing contributions will use their great influence towards making this information available as a part of the program of the "New Deal."

The various contributions that have been made upon the factors that determine the value of milk are of outstanding importance, because we have been accustomed to think of milk as a substance of more or less definite and fixed chemical value. We must change our conception of this matter, because we now know of no substance that is more variable in its chemical content than is milk. This statement applies to the mineral elements and vitamins. The chemical contents of the food and water ingested by the lactating animal is in the absence of disease reflected in the milk. We have been accustomed to think of milk as our best and most satisfactory sources of supply for such essential salts as calcium, phosphorus and magnesium, but we have recently been informed that unless there is an adequate supply of iodine in the diet, that we do not obtain a balance in these salts which is requisite for metabolism. Since these facts have been made known certain commercial interests have instituted the practice of feeding their dairy herds sodium iodide or other preparations of iodine. They have overlooked the fact that by feeding inorganic preparations, results are entirely different from feeding organically bound iodine, because it was shown by McClendon and co-workers that while as the result of feeding the inorganic preparation to dairy cattle, large amounts of iodine would appear in the whey just as it would in the urine of the animal, but only by the organic route would the iodine appear in the cream and as diiodotyrosine, the form in which it is believed it must be converted before being fully utilized by the system. Consequently, processors of milk should be taught that in order to supply milk of such standard, they must feed their dairy cattle feeds of naturally high iodine content. This can be accomplished by fertilizing the feeds during its growing period with materials rich in iodine.

The thin green leafy vegetables are excellent sources of the mineral elements and vitamins, as well as sources of chloraphyll, carotene and myrtillen.

Spinach dehydrated and administered as a concentrate is such an extraordinarily valuable source of the mineral elements and vitamins as to deserve special attention. I know

of no other means by which the blood may be maintained in a faintly alkaline condition as through the regular feeding of this substance. As a therapeutic measure, for the regeneration of hemoglobin, as a general laxative tonic, it has a deserved reputation.

Recently attention has been called by Webster, Chesney and Clawson, and subsequently confirmed by Marine and others, to the fact that the feeding to rabbits of cabbage and other members of the Brassica group of vegetables, such as Brussels sprouts and cauliflower, grown in certain localities, brings about goiter in a relatively short time. This is caused by the presence of mustard oils which yield cyanides on hydrolysis. It is a significant fact that if iodine is added to the diet to care for increased demand created by cyanides, goiter does not result. The presence of cyanides in cabbage is not the sole reason for its goitrogenic influence, because it has been found that cabbage is an unusually rich source of calcium.

Culhane, DuPré and Semanoff all found that the feeding of cabbage raises the calcium content of blood serum. Baumann, Kurland and Metzker found that when goiter is produced in rabbits by cabbage feeding, there results a definite retention of calcium, phosphorus and magnesium in the body with resulting loss of balance. When iodine is administered to cure such goitrous animals, there is a restoration of balance in these elements which is brought about by an increase in the amount excreted.

We are accustomed to look upon the cereal grains as our most reliable source for supplying energy and heat. When used as whole grain cereals we may confidently realize our expectations, but when the cortical and germ portions are removed, they exercise a decalcifying influence. Mellanby and others have demonstrated that it is well-nigh impossible to prevent tooth decay when an animal is regularly fed oatmeal and white bread. It is a question in my mind whether it is possible to supply those chemical factors which we recognize as responsible for maintaining calcium balance in sufficient proportions to overcome the decalcifying influence of either white bread or oatmeal. It is unfortunate that either should have become so prominent in the diets of the American people.

Our attention has recently been called to the fact that of the 600 poisonous fungi that infect cereal grain, more than 300 of them are present in the United States. My authority for this statement writes that in one of our states hundreds of thousands of bushels of cereal grains are sold and consumed that are unfit for animal consumption.

In our selection of fruits, whether they be oranges or tomatoes or what not, in order that they may supply the elements for which they are reputed to be valuable, they must be naturally ripened, because when gathered unripe and ripened by any physical or chemical agents, they are deficient in all the chemical elements which they possess when naturally ripened.

We are just beginning to recognize and appreciate the great value of crustaceous fish as excellent sources of many of the more important elements necessary to meet nutritional requirements and which are often deficient in our diets. The study made on oysters at the South Carolina Food Research Laboratory in collaboration with the United States Government developed the interesting information that they exercise an extraordinary influence in promoting hemoglobin regeneration. From this study we are convinced that if oysters served in ordinary proportions were eaten two or three times a week that nutritional anemia could not develop and from our present conception of the etiology of primary anemia it is probable that disease would not develop on this diet.

In selecting meats we must bear in mind that although the taste of the average American decidedly favors muscle meats, they are not comparable in nutritional value to the internal organs. The nutritional value of muscle meat is at least limited, but the internal organs, like oysters, supply many of the elements that are ordinarily either lacking or deficient in the average diet. Since we have learned of the indispensable functions of organic iodine in nutrition, it would seem advisable for all who reside in goitrous areas to include in their daily diet one of the crustaceous fish.

In our studies of nutritional problems we have found no more interesting phase of the subject than an investigation of diets upon masses of people, particularly as to personal health and efficiency, and mass attitude towards national and international problems.

We have first hand information in regard to the Japanese people. McClendon, of the University of Minnesota, spent one year in the study of the diet of the Japanese and its effect upon the people. He found there was only one case of goiter to a million of population; there was no radium in Japan from which we infer that cancer is not a problem there; the inference is made that diseases referable to the glands of internal secretion is not a factor there. He reports as follows upon their diet: They consume in some form great quantities of the many varieties of sea weeds which he finds by analysis to be enormously rich in iodine. More than two million people are engaged in the fish industry and they consume large quantities of sea fish, which he finds to be an excellent source of iodine. As human excrement is used as fertilizer there, it is found that the fruits and vegetables are all good sources of iodine. We learn from other sources that the dairying industry is unimportant in Japan, but they consume great quantities of soy beans, whose protein closely resembles that of milk. We also learned that refined cereals do not enter into the diets of these people, but unpolished rice is a very important article of diet with them. From long adherence to the Buddhist religion, animal meat is relatively scarce in Japan and therefore, muscle meat, except those derived from fish, is almost absent from their diet. It will be seen from this brief outline that it is probable that the Japanese come nearer adhering to what we understand is a satisfactory diet than any other people in the world and as a result of this diet we recognize that they exhibit such characteristics as mental alertness, great energy, remarkable physical strength and extraordinary endurance. Their ability to pursue policies in a sustained and vigorous manner is unequaled by any other people of modern times.

In contrast to the practical absence of goiter in Japan is its great prevalence in China. Dr. McClendon and Professor Adolph, of the University of Yangching, found that in the region of the easterly and westerly burial places in a radius of 50 miles around Peking every one suffered from goiter and that in these regions the diet contained little iodine. The population of this region present certain characteristics which experience teaches us we may attribute to their deficient diet. They are comparatively short lived, of poor physique, lacking

in strength and vigor, are restless and appear incapable of maintaining a sustained policy or a stable government.

We have had occasion to study the diets and their effects upon the population in a rather limited section of the United States. We found that the people who live in this locality are of large stature, strong, robust, enjoy good health and for Americans, law abiding. Analyses of their foods developed the information that the calcium, phosphorus, magnesium elements were fairly high. The iodine content of their foods was relatively enormously high and that their vitamin requirements were all provided for.

Huntington, of Yale, in his very interesting work, "Climate and Civilization," attempts to prove that climate exercises a determining influence upon civilization. He contrasts the virility of the Canadians with the improvidence and laziness of the Bahamans. He asserts that at the time of the American Revolution many loyalists in the northern states emigrated to Canada and many from the south to the Bahamas. He assumes that the ancestors of the present people were equally capable and aggressive, though of different mental types. He emphasizes the fact that the descendants of the Canadians are industrious, educated and progressive, while the present Bahamans are indolent and unprogressive, and that succeeding generations have suffered retrogression. He calls attention to the stimulating effect of the climate of lower Canada and he asserts that the climate of the Bahamas is mild and uniform.

It is interesting to analyze the prevailing diet of the two peoples and to evaluate results. McCollum writes that the Bahamas produce tamarinds, oranges, lemons, limes, olives, citrons, pineapples, pomegranates, sapodillas, bananas, melons, yams, potatoes, cucumbers, cassavas, sugar, maize and peas as the chief articles of food. The breadstuffs and meats are imported from the United States. He calls attention to the fact that this list of foods would not form a satisfactory diet and contrasts it with the people of lower Canada, which contains liberal amounts of milk, butter, eggs, cream and cheese in addition to the cereals, legume seed, tubers and meats. When we compare the advantages and deficiencies of these two diets and the reaction, we will understand that although neither diet is satisfactory, that the Canadian one is by far the superior.

It will be of interest to you to observe the physiological reactions to the diets of certain people who in their observance of religious rites for more or less protracted periods are called upon to abstain from meats and fats. A study of the present population of Russia under the former political regime who rigidly observed Lent and during this 40 day period their diet contained no foods containing vitamin A. Following this period of fasting it was observed that many of them had xerophthalmia, nyctolopia of hemeralopia, various catarrhal involvements and ear abscesses, and many symptoms referable to the organs of special sense. Similar observations have been reported by Grenfel in Labrador and by Appleton in Newfoundland and Labrador.

In Burma, where the diet of the population has for a long period of time been deficient and restricted, being largely composed of polished rice, the people have steadily degenerated. Beriberi is quite common and the nervous system of the people is generally unstable. This condition has prevailed over such a long period of time that the British have for many years discontinued using the Burmese in their military establishment.

We are not aware of any satisfactory explanation why, from a deficiency of vitamin B there should result an enlargement of the adrenals, but a decrease in the size and weight of such organs as the thymus, testes, spleen, ovaries, pancreas, heart, liver, kidneys, stomach, thyroid and brain. How many of us have attributed a disorder of any of these organs to a vitamin B deficiency?

When vitamin B is deficient in the diet there occurs a loss of appetite, restlessness and failure to grow. If the deficiency continues the nerves become involved and there develop polyneuritis in animals and beriberi in man. We now recognize beriberi to be due to vitamin B deficiency, and all who have seen this disease will at once recall that the organs of special sense become involved.

Among the important manifestations of vitamin B deficiency is regression of the nerves supplying the organs of special sense, as may be noted by hoarseness and aphonia, disturbance of the optic nerves, central scotoma and amblyopia, and paresis of the nervus abducens, which is the sixth of the eye moving nerves. Other important manifestations of

vitamin B deficiency are atrophy of lymphoid tissue. When an excess of lymphoid tissue is found in the nasopharynx and throat, we may be sure that there has existed in the diet a relative deficiency of vitamin A and an excess of vitamin B.

It is known that when the dietary factors that influence or control growth and development are interfered with by a deficiency of one element and excess of another, nature does not adjust the inequality and the normal processes are interrupted. To this rule the special sense organs are not accepted. It is also true that a deficiency of several of the food elements may be responsible for a defect of a special sense, all operative at the same time, but in a different manner. For instance, a deficiency or unbalance of calcium and phosphorus and a deficiency of vitamin D may cause a malformation of the malleus, incus and stapes, thus resulting in deafness, or should there be an excess greatly above the normal of vitamin B over vitamin A in the diet, there may be a proliferation of lymphoid tissue sufficient to block the air from the Eustachian tubes and cause them to collapse. If this tissue is scraped away, hearing will be temporarily restored. If, however, food containing a large amount of vitamin A is not given, the lymphoid tissue will recur and will continue to grow until the drum membrane will finally fail to function.

McCarrison and others report that a deficiency of vitamin A in the dietary results in a weakening of the body and increased susceptibility to many infectious diseases, especially of the eyes and ears. It has been repeatedly observed that rhinitis, conjunctivitis and otitis media are of frequent occurrence in children whose diet is markedly deficient in vitamin A. This vitamin exercises the same controlling relation to xerophthalmia as does vitamin C to scurvy. It must be understood that for the production of xerophthalmia this vitamin must be absent or markedly deficient for a considerable length of time. When deficient for a short length of time following the exhaustion of the storage supply there will occur milder manifestations involving the eyes. In this connection it is interesting to note that in children vitamin A deficiency usually manifests itself by involvement of the eyes and in adults the air passages and lungs.

Among the manifestations observed in vitamin C deficiency are minute hemorrhages into the taste buds, producing either

an absence or perversion of taste. At times there occur hemorrhages of varying degrees into the ocular conjunctiva, the orbit or the eyelids. When hemorrhages occur into the orbit blindness may result. A prolonged deficiency in vitamin C produces an enlargement of the suprarenal glands with consequent disturbances of their function. Among these disturbances may be those of vision and hearing.

We conclude that deficiency of vitamin D during the latter part of pregnancy is often, if not always, responsible for the various forms of squint that develop during early infancy. In these cases, where squint exists, there will be found other evidences of vitamin A and D deficiencies.

Without a relatively large amount of phosphorus or one of its compounds, life cannot exist. Numerous experiments have proved that there can be no substitute for this element, as there may be for some of the other mineral salts. Unless it is supplied in considerable quantities the more important organs, such as the brain and the special sense organs, cannot function. It is known that as the phosphorus supply is reduced there occurs a slowing down of all the higher functions.

The exact relation of blood phosphorus to adenoids has not been fully determined, but it has been observed that the blood phosphorus is much below normal in children when this defect exists.

In order to illustrate how complex are the processes of nutrition we may mention what has recently been discovered in regard to chloraphyll, carotene and vitamin B. Chloraphyll was formerly regarded as a pigment without definite significance. We now associate it with a comparatively vitamin A content. It has been demonstrated that green vegetables contain a much higher vitamin A content than do white ones. It is also known that marine algea containing chloraphyll synthesizes vitamin A while other pigments do not. There is much evidence available to the effect that chloraphyll rich vegetables are good sources of vitamin B also.

Carotene is supplied by green and yellow vegetables where it is synthesized and is the precursor of vitamin A in the animal. The transformation of carotene takes place in the liver and this organ is believed to regulate the distribution of vitamin A to other parts of the body.

It unquestionably possesses fundamentally important functions. It appears to possess favorable therapeutic influences over certain diseases of the eye and its structures and even more remarkable curative effects in diseases of the respiratory tract, the skin, ear and in sinus infections.

You are all, no doubt, familiar with the spectacular results reported by Mellanby in his treatment with carotene of the epidemic of pneumonia at the Kimberly diamond mines.

Our information in regard to myrtillen is scanty. It appears to be a rather regular chemical substance in certain berries and vegetables, notably spinach. It is supposed to be concerned in the metabolization of sugar.

Nature has been most generous in supplying a great number of sources and a liberal variety of materials from which to select diets such as will meet the bodily requirements. It is neither necessary nor advisable to resort to artificial sources and usually she places severe penalties upon so-called refinements of natural materials.

1428 Lady Street.

SYMPOSIUM ON NEWER CLINICAL APPROACHES.

II.—THE AUTONOMIC LEVEL.*

DR. FRANCIS BLACKMAR, Columbus, Ga.

From medical student days we have been familiar with a vast amount of clinical data relative to the autonomic nervous system, but we lacked a means of applying this information. Cannon's book on the "Body Reactions in Pain, Anger, Fear and Hunger" is a most valuable collection of such information, but it does not describe an indicator which would help the clinician to determine the part of the autonomic system that is dominating in any particular patient when seen by the examiner.

Dr. Jarvis and his friends furnished us with the necessary key. By the color of the nasal septum we believe we can tell, with certain restrictions and limitations, where the patient's autonomic level lies. We can often say with conviction here is a patient with a dominant sympathetic nervous system, whose fires burn more rapidly than fuel is furnished. Again we can say here is a patient with a dominant parasympathetic system whose fires burn too slowly. This may be due to a weakness of the catabolic glands in relation to the anabolic glands or some of the other factors to be mentioned.

The autonomic nervous system is composed of two antagonistic parts, the sympathetic system and the parasympathetic system. The parasympathetic system directs the accumulation of reserves and the sympathetic system directs the expenditure of these reserves. Thus in the liver glycogen accumulation results from parasympathetic stimulation and glycogen is mobilized as blood sugar when the sympathetic nerve supply is stimulated. In sleep the parasympathetic system should dominate in order that the reserves of the body

---

*Presented as part of a Symposium at the Annual Meeting of the American Laryngological, Rhinological and Otological Society, held at Charleston, S. C., April 3, 1934.

Editor's Note: This ms. received in Laryngoscope Office and accepted for publication, May 14, 1934.

can be reaccumulated for the next day's work. In extreme danger the sympathetics take complete control for the period of the emergency.

Knowing of no term to describe this resultant shifting of the two opposing parts of the autonomic system, the author has named the resultant of the tug of war the autonomic level. Patients with a dominant sympathetic system have been spoken of as being in a state of sympatheticotonia and those with the parasympathetic system dominant as being in a state of vagotonia. It seems to the author that sympathetic dominant and parasympathetic dominant more clearly expresses these clinical conditions.

Dr. Jarvis and his friends have long and fruitfully studied the clinical pictures associated with pale and red nasal septa. The author has applied these observations plus others which seemed applicable to the terms of the autonomic system. The application of their clinical observations to the autonomic nervous system is founded upon *the belief that a red septum indicates sympathetic dominance and a pale septum indicates parasympathetic dominance IF THE SEPTAL COLOR IS NOT INFLUENCED BY LOCAL PATHOLOGY.*

A patient in whom the sympathetic system has persistently dominated for days, weeks or years may give a history of nocturnal restlessness, arising unrefreshed by the night's rest and becoming drowsy during the day. They may be eaters of meat, eggs, fish, salt or sweets in excess. If they are not open air workers provided with a plentiful supply of calcium and other minerals in their diet they are likely to exhibit dental caries. They are subject to frequent infections by staphylococci and are susceptible to streptococcic infection, if contaminated by a virulent strain of this germ. Due to this predisposition to infection by the two most frequent infectious agents, such a patient's autonomic level is said to be in the infection zone. This statement will be explained later. These patients have developed a marked immunity due to repeated mild infections. Their attacks of rhinitis are likely to be real infections, with neutrophiles predominant in their nasal secretions, rather than vasomotor disturbances with eosinophiles. Their nasal septa are typically red.

A patient with a dominant parasympathetic system has a pale septum and often presents some combination of the

following conditions: angioneurotic edema, itching skin, migraine, asthma, eczema and digestive disturbances. They frequently give a history of gall duct obstruction, are heavy sleepers, unless in one of their frequent periods of nasal obstruction. They are as a class subject to "catarrh" and colds, but it will be found that these colds are primarily vasomotor disturbances with eosinophiles predominating in their nasal secretions, even though infection may become a sec-

ondary process. They are frequently fruit and vegetable eaters with little meat, eggs, fish or salty foods. Low blood pressure is the rule in their youth but frequently their blood pressure will rise with alarming rapidity, especially in later life. Such elevated blood pressures in the author's experience are usually corrected by measures used to balance their autonomic level.

We have a chart (see Fig. 1) to help us visualize the best understood factors influencing the autonomic level. Many fac-

tors of clinical value have not been included because they are still being studied. The thin slide represents the autonomic level. We indicate sympathetic dominance and a red septum by shifting the slide up. Parasympathetic dominance and a pale septum are indicated by shifting the slide down. A balanced autonomic system is indicated by placing the slide midway.

The accepted factors exerting force tending to shift the autonomic level which are incorporated in this chart are the acid-base ingestion ratio, the sodium-potassium equilibrium, the fluid intake and the glandular equilibrium. It may be that the acid-base and sodium-potassium intake factors really act through their effect upon the endocrine glands. At the top of the chart are placed the factors exerting a pull on the autonomic level toward sympathetic dominance. An excessive intake of acids over alkalies tends to produce a shift toward sympathetic dominance, an excess of sodium exerts a similar force accompanied by a greater tolerance for fluids. The glands whose secretions exert a force toward sympathetic dominance when stimulated are the suprarenal, thyroid and pituitary glands. On the lower part of the chart are grouped the factors tending to result in parasympathetic dominance. They are an excessive intake of alkalies, and potassium associated with a poor tolerance for fluids and excessive pancreatic activity in relation to the suprarenals, thyroids and pituitary.

Clinically there seem to be two types of pale septum patients. One group has little or no reserve strength and is probably deficient in internal secretion from the suprarenal, thyroid, ovaries or pituitary glands. Other people in the pale septum group, although they have low blood pressure, are capable of an unusual amount of physical exertion. It may be that in these individuals their dominant parasympathetic system depends upon a pancreas which is more than adequate rather than a deficiency of its antagonists.

Clinically it has been noted that as the color of the septum shifts toward redness and sympathetic dominance, a point is reached sooner or later where the patient becomes subject to staphylococcic infection and then streptococcic infection. With the first sign of infection, often furuncles, it is believed that his autonomic level has reached the upper limit of his symp-

tom-free zone. Likewise it has been noted clinically that as the septum becomes pale with parasympathetic dominance a point is reached where symptoms, mainly of an allergic character, manifest themselves. It is believed that such a patient has reached the lower limit of his symptom-free zone. The width of this symptom-free zone varies with immunity above and desensitization below. These in turn are influenced by heredity, past infections, and other well recognized factors.

Definite therapeutic indications and limitations seem indicated and can be tabulated as follows:

1. Allergic symptoms and parasympathetic dominance as shown by a pale septum indicate the need of an attempt to balance the autonomic level.

a. If this is accomplished and the allergic symptoms are relieved, the cause of the allergic symptoms can be accepted as having been due to an autonomic level displaced down into the allergic zone and not to hypersensitivity. Tests for neither hypersensitivity nor desensitization would seem indicated.

b. If the allergic symptoms continue after the autonomic level is balanced or even a red septum has been produced there is hypersensitivity present. To attempt an autonomic shift further into the infection zone would seem dangerous. Specific tests should be employed and desensitization would seem to be urgently indicated.

2. Staphylococcic or streptococcic infection with sympathetic dominance and a red septum would indicate the need for balancing the autonomic level.

a. If following this, improvement and cure occurs without recurrence it can be assumed the autonomic level was displaced into the infection zone and there was no lack of immunity.

b. If in spite of a balanced autonomic level infection continues or recurs, a lack of immunity is indicated and vaccines must be used in an attempt to build up immunity.

It has been the author's experience in long standing allergics that frequently furuncles occur long before a pale septum has become pink or even neutral. It is believed that in such cases a prolonged freedom from infcction has resulted in a gradual loss of immunity and the autonomic level enters the

infection zone before parasympathetic dominance has been overcome. The remedy here is to build up bacterial immunity with vaccines ahead of the autonomic shift.

It will be noted that staphylococci and streptococci have been used as examples of bacteria occupying the infection zone. It is the belief of the author that a few bacteria themselves tend to produce a shift toward parasympathetic dominance. Generally these are bacteria which when grown on protein media increase the alkalinity of the media. Examples are the spirochete of Vincent's and B. diphtheria. Clinically the author believes that whooping cough and influenza also produce a shift toward parasympathetic dominance.

In the case of bacterial allergy the explanation may be that infection leaves certain tissues hypersensitive to specific bacterial proteins. The streptococcus is the usual offender. After the patient recovers, minute quantities of this bacterial protein, far less than is usually present in the active primary infection, will result in severe local symptoms out of all proportion to the severity of the infection. During the secondary phase there is a true bacterial allergy. Parasympathetic dominance in this phase seems to favor the production of allergic symptoms by minute quantities of the specific bacterial protein circulating in the blood. Sympathetic dominance would still predispose to added infection.

Therapeutic agents are used in the hope that they will produce a shift of the autonomic level, shorten specific lines or widen the symptom-free zone as a whole.

Pharmacology and endocrinology have been busy for years supplying us with agents to shift the autonomic level. Examples are atropine, eserine, hydrochloric acid, table salt, alkalies of various types, and the glandular extracts singularly or in various synergistic combinations. With the use of almost every local application or internal medication one is faced with the choice of several agents, some of which, aside from their special indications, are anabolic, catabolic or neutral in reference to the autonomic level. Due to an inability to estimate the patient's autonomic level the safest agents have been those whose effects upon the autonomic system were lessened or prevented by combining ions with equal effect on the two sides of the equilibrium. After years of practice clinicians

who were close observers became able to develop a sixth sense which told them in which direction the autonomic level should be shifted. They seldom if ever thought in terms of the autonomic system but if we study the therapy of the better empirical clinicians it will be seen that the man with years of experience has slowly and painfully learned that his best results were obtained when he accomplished exactly what we do when we fit our therapy to the autonomic level as visualized with the aid of the color of the nasal septum.

Swift Kyle Building.

THE AMERICAN BOARD OF OTOLARYNGOLOGY.

An examination was held in San Antonio, Tex., Nov. 13, 1934, during the meeting of the Southern Medical Society. Twenty-five candidates were examined, of which number, seven were conditioned or failed.

During 1935, examinations will be held in New York City, June 8, in connection with the meeting of the American Medical Association, and in Cincinnati in the Fall, during the meeting of the American Academy of Ophthalmology and Otolaryngology. Prospective applicants for certificate should address the Secretary, Dr. W. P. Wherry, 1500 Medical Arts building, Omaha, Neb., for application blanks.

SYMPOSIUM ON NEWER CLINICAL APPROACHES.

III.—NEWER CLINICAL USES OF INSULIN.*

DR. SAMUEL M. BEALE, JR., Sandwich, Mass.

Introduction: Over five years ago in my work as a general practitioner I observed the improved growth of a toenail of a diabetic who had been receiving insulin for several weeks. This patient, a laborer, age 63 years, had lost his right leg above the knee by amputation on account of gangrene, which started in the big toe. In September, 1928, he had an infected ingrowing nail in the remaining big toe. The nail was very thin from defective nutrition. The infected area about the nail was a dirty gray with threatened gangrene. Insulin was given three times daily. Weeks were required to secure healing. When it was complete it was noted that the new nail above the matrix, which had grown while the insulin was being given, was better nourished. It was thicker, whiter and flatter than the previous growth. Just here I got my impression that the insulin affected the nutrition of the nail profoundly.

It occurred to me that the improved growth of the nail might be an index to the improved circulation of the whole foot and body. After several months diet alone controlled the glycosuria and the insulin was omitted. Subsequent clinical experience with other cases led me to prescribe a small dose of insulin twice a week. The record of the insulin on the growth of the toenail is very clearly indicated.

During the absence of the insulin the nail is thinner and contracted. Now after more than five years this patient remains in good health, sugar-free, the circulation of his foot is good, the toenail is smooth and symmetrical and contracts

*Presented as part of a Symposium at the Annual Meeting of the American Laryngological, Rhinological and Otological Society held at Charleston, S. C., April 3-4-5, 1934.

Editor's Note: This ms. received in Laryngoscope Office and accepted for publication, May 14, 1934.

slightly and gradually from the matrix toward the end. Insulin is continued twice weekly, not with the thought of glycosuria in mind but with the thought of maintaining the circulatory and nutritional status.

INSULIN A REGULATOR OF THE ENDOCRINE GLANDS.

The endocrine glands represent the vegetative mechanism, that part of the body which has to do with the growth and nutrition. Insulin is a product of one of the important glands of the vegetative mechanism and appears to be its great regulator. If a disease can be interpreted as a manifestation of vegetative dysfunction, may we not approach an understanding of the basic cause and rational treatment of this same disease? Inheritance in part determines the original setup. Activities vary with time, mental, physical and spiritual environment of the individual and also according to substance ingested.

HOW DOES INSULIN OPERATE?

At first, insulin was used only in the treatment of diabetes but later research has shown it to be employed in a great variety of maladies.

The great question is, "How does it operate?" It is thought to increase the permeability of cells for sugar. Part of cell sugar is oxidized and the remainder changes into glycogen. In the tissues, insulin causes a change of carbohydrates into fat and increases the glycogen in muscle tissue. Insulin converts glucose into an easily oxidizable form. It increases basal metabolism with a rise in the respiratory quotient, probably through the sparing of protein.

In my hands, insulin lowers blood pressure, causes hypoglycemia and causes cutaneous melanophores to recede and often disappear. I have been asked repeatedly to explain how so small a dose as three units of insulin operates when it is known that the pancreas produces much more in a short time. This I am unable to answer. We may speculate, however. From the pancreas, insulin is produced in response to physiologic demands and may soon cause other endocrine activities which may modify its effects (from the adrenals, the thyroids or the posterior pituitary perhaps). By the hypodermic route it breaks in suddenly on a set of physiologic processes from

a different point and for this reason alone may produce altogether different effects. In a small dose coming suddenly into the circulation, may it not have a tonic stimulating or jolting effect upon other endocrines and thus produce greater results than by influencing directly any amount of food substance in the circulation?

RELATION OF INSULIN TO CALCIUM METABOLISM.

Somewhere in my reading I came upon the simple statement that insulin has an effect on calcium metabolism. I regret that I am unable to find this reference and give proper credit for it. This statement, however, is corroborated by the work of Brougher.[1] Insulin was one of the substances used in trying to save the lives of parathyroidectomized dogs. It was hoped that the insulin would cause a hypoglycemia and thus overcome the anorexia which is characteristic of these dogs.

Fifteen minutes after the dose of 20 units of insulin was given to one of these dogs, he aroused himself from his languor, became more active and drank his milk, which for the previous two weeks had been administered by stomach tube. In view of this astonishing change and since the symptoms manifested by parathyroidectomized dogs are considered to be due to changes in blood calcium, the study of the blood calcium in normal and parathyroidectomized dogs after insulin administration was undertaken. He concluded that in both normal and parathyroidectomized dogs blood calcium is increased for a period of two and one-half hours after the administration of insulin. He also refers to the work of Davies,[2] Dicken and Dodds, who show that by the administration of insulin they were able to raise the blood calcium. Brougher also states, "Insulin may have no direct influence on the calcium metabolism but indirectly by its influence on the inorganic phosphates through carbohydrate metabolism the calcium ions are liberated. Grant[3] and Gates in their study of factors affecting levels of serum calcium and phosphorus have shown that higher calcium levels are accompanied by lowered phosphate levels in the blood, and vice versa.

These researches associate insulin with both calcium and phosphates in metabolic processes and suggest that it may have a determining influence on calcium phosphorous balance with all that signified.

THE ASSOCIATION OF CALCIUM THERAPY WITH INSULIN THERAPY.

R. J. Behan,[4] in his article of "Calcium Treatment of Pain in Cancer," states, "by the use of calcium the growth of cancer itself is frequently retarded and may be totally controlled." "It merits a high place in the therapy of cancer if it only relieves pain and renders the use of narcotics unnecessary. Every patient affected with cancer has pain at some period of the disease. This can be controlled by narcotics in constantly increasing dosage. Calcium may be substituted for narcotics. It either entirely controls the pain or greatly reduces it. Calcium is not harmful and seems to have a certain action on the cancer tissue. It acts by decreasing cell permeability, lessening edema, reducing glycolysis and decreasing the sensitivity both of nerves and nerve centres. In all my cases it has had a beneficial influence." The ability of insulin to raise blood calcium naturally associates calcium therapy and insulin therapy together.

THE ASSOCIATION OF PARATHYROID THERAPY WITH INSULIN THERAPY.

Collip[5] shows the effect of parathyroid on calcium metabolism. Reding[6] uses calcium and parathyroid with some success in cancer.

Cantarow[7] states that the parathyroid is chiefly a calcium mobilizer. Its principal function is to maintain a normal blood calcium level. It should be useful in hypocalcemia and is believed capable of restoring normal balance between the diffusible and nondiffusible fractions of serum calcium. It may elevate serum calcium above normal level and may be used to produce a hypercalcemic effect when such a state is therapeutically desired.

Collip[5] established that parathyroid glands govern calcium metabolism to a marked degree and that the harmone functions primarily as a calcium mobilizer. On the basis of these observations, Reding, collaborating with Slosse, administered the parathyroid principle to a woman, who had been operated upon for a cancer of the breast three and one-half years previously. By this method an alkalosis had been changed to a relative acidosis. Calcium level had risen meanwhile and it

was believed that this prophylactic treatment had diminished danger of recurrence. The same serum changes were secured also in two cases operated upon for cystadinomas of the breast. The influence of parathyroid and insulin on calcium suggests the use of these two therapeutic agents together.

THE ASSOCIATION OF VITAMIN D WITH INSULIN THERAPY.

Vitamin D also has been shown to be vital in order to secure utilization of calcium to prevent its rapid elimination.

Cantarow observes that both parathyroid hormone and Vitamin D are required in order to secure proper utilization of calcium.

SUBSEQUENT OBSERVATIONS.

In November, 1930, a fisherman, age 63 years, who was a nondiabetic, presented himself with a purple swollen right foot and complete stasis of the circulation. On account of impressions received from the toenail case relating to circulation and nutrition, it was decided to see what insulin would do in this nondiabetic. Ten units of insulin were given and the foot elevated and kept warm. Within 24 hours, the swelling was gone and the foot was pink. Subsequent treatment consisted of five units of insulin given once each week. Improvement in the growth of the toenails in this case has been more marked than in the diabetic case. Due to the anxiety of friends, a surgeon was called in consultation and advised amputation, but the patient decided against this. X-ray showed advanced degenerative changes in the bones of both feet. The blood supply to the bones of the great toe was later entirely stopped, and in October, 1931, amputation of this toe was done instead of the leg above the knee, as was advised a year before. At operation three ligatures were required to control bleeding and there was also free oozing from the cut surface. On account of the abundance of blood supply to the soft parts, the wound was closed with sutures instead of being left open to granulate. Healing of the amputation wound was slow but was eventually complete. Now, after more than three years, this patient has a usable foot and leg. His orders are to receive two doses of insulin per week. The dose is limited to two units, more causes hypoglycemia.

After treating many nondiabetics with insulin over a period of three years, I extended its use to cancer by what appeared to me a logical step. I had seen a huge leg ulcer which followed septicemia and which had resisted all treatment for two years heal completely after two small doses of insulin per week were added to the treatment. Also, I had seen a gangrenous area slough out from an old man's heel, leaving a healthy granulation surface, which went on to complete repair on small infrequent doses of insulin. Soon after the latter case there came to me a woman, age 67 years, having a huge cancer (simplex) of both breasts and chest, extending from the navel to the trapezeii muscles and neck and from the left shoulder to the right axilla. At the midsternum was a necrotic area two and one-half inches across, and below the left breast was another more than twice as large. There was involvement of both lungs.

Having seen the cases mentioned above recover under insulin, it occurred to me to see if the same remedy would make any difference in this desperate case. On Sept. 27, 1931, I gave five units of insulin and repeated the same dose daily. On Oct. 10, 1931, less than one month later, both necrotic areas were entirely healed over and were dry. The great mass covering the whole chest had shrunken until the skin was wrinkled and dry, whereas it had been tense, moist and oozing serum. This patient died as the result of double hydrothorax, which she would not allow me to aspirate. In spite of her death, I was so impressed by the change produced by insulin that I have persisted to the present day in my search for further light. From observations made, it seems possible to conclude that insulin is of distinct help in circulatory disturbances, whether inflammatory or degenerative, and ulceration of tissue, whether benign or malignant.

OBSERVATIONS RELATING TO OTOLARYNGOLOGY.

Some of the following observations may be of interest to those limiting their practice to otolaryngology:

Case 1: Mr. A. J., age 65 years. His chief complaint was progressive deafness, which his aurist believed was due to involvement of the auditory nerve. Vertigo developed rapidly but was never severe; in fact, the chief reason for his seeking help was the inability to swing a golf club without losing his

balance. This was about the first of November, 1931. There had been some slight digestive disturbance and treatment was at first addressed to this without making any impression on the vertigo. An aurist, with whom I conferred by telephone, suggested that sclerosis of the vessels of the middle ear might be the cause of the disturbance. If this was a sclerotic condition involving the fine structure of the middle ear, insulin might be of help. I gave three doses each of three units over a period of four days, with the result that the vertigo entirely disappeared and the patient returned to his golf.

Case 2: Rev. G. C. E., first seen on April 10, 1933. There was a hyperkeratosis on the right cheek near the ala of the nose, 0.6 cm. by 0.5 cm. It was crusted and presented an ulcerated red base and was causing some irritation. He was given two units of insulin and one of parathormone at rather irregular intervals. Sometimes twice, sometimes three times each week. He was also given calcium lactate, 5 gr., with each meal, and three drops of viosterol also with each meal. In two months this growth was entirely gone, leaving a very small dimple in its place.

Case 3: C. H., age 41 years. He was seen first on July 3, 1932, on account of a growth on the roof of his mouth. The teeth had been removed from the upper jaw several years before. This growth was brought to his attention for treatment by his dentist, who refused to make a plate for him until this growth was removed. Just back of the margin of the gum to the right of the median line was a depression made by the stem of his pipe. Directly back of this was a growth elevated about one-sixteenth of an inch and light in color, and back of this was a larger area, faintly pink except the margin, which was redder than the normal mucous membrane. This growth appeared just where the hot smoke from his pipe had come in contact with the roof of his mouth. There was a small ulcerated area on the first mentioned growth. For a month, treatment consisted of three units of insulin given once a day before a meal, also 5 gr. of calcium lactate and three drops of viosterol with each meal. During the following two weeks and a half he received five hypos. At the end of this time the growth was gone. His dental work was then done.

Case 4: L. V., male, age 51 years, was first seen Nov. 14, 1932. What appeared to be a cold sore appeared on the lower lip during the previous summer and tended to increase. It was ulcerated and painful, some pain extending into the lip below. When seen, this growth had the appearance of a squamous-cell carcinoma. On three units of insulin and one of parathormone and 15 gr. of calcium lactate a day, together with three drops of viosterol with each meal, this growth gradually regressed until Dec. 12, when all that was left was a little white spot on the lip, where the saliva kept it moist. This remained unchanged and on Jan. 18, 1933, it was fulgurated. On Jan. 22, there was only a scar left and there has been no recurrence to date, March, 1934. The Wassermann report was negative.

Case 5: J. F. C., farmer, age 72 years. Basal-cell carcinoma of right cheek, sectioned. It was one inch across, Dec. 15, 1931, when he first came to see me. A small growth had been present in this location for a year or more but had given no concern until it began to cause some irritation. When first seen, the surface of this growth was raw and oozing a small amount of serum. I have had him under my care now for over two years and in that time the growth has apparently disappeared on more than one occasion, but some active malignant cells have persisted. The matter of cure has not been of paramount interest to him. He has declined to go to the hospital to have radium used. At the present time the growth is smaller than it has ever been since the treatment was begun, even the part which can be detected underneath the skin. The present reduction has been obtained partly by the external application of a calcium and lanolin ointment. Insulin, parathormone and calcium are still being given twice a week. The patient's general health has improved.

Case 6: Insulin in syphilis and cancer. G. R., age 70 years, was first seen on Oct. 13, 1932, with a hospital diagnosis of an epithelioma of the lower lid of the left eye and blindness in the right eye from a disseminated choroiditis of syphilitic origin. The usual dose of three units of insulin and one of parathormone once daily before a meal and 5 gr. of calcium lactate with each meal, with three to five drops of viosterol was prescribed. The growth in the left lower lid gradually diminished in size. In an attempt to hasten its healing, I

made small punctures in the surface of this growth in order to allow the escape of fluids contained within it and it seemed to me that after these punctures were made the shrinkage of the growth was hastened materially. On June 20, 1933, after an examination at the hospital where the original diagnosis was made, it was the opinion of the examining surgeon that there was no cancer present.

After about six weeks of treatment, this patient announced that vision was returning to his blind eye. He had discovered that he could see to drive his automobile with his good eye closed. A recent test of vision of this right eye demonstrated a degree of vision identical with that last observed. In other words, there has been a limited restoration of sight. This patient is still seen at least once each week and receives the insulin as before. He has received no other treatment while under my care.

From the foregoing it would seem that insulin is indicated in the otolaryngology when there is: *1.* a degenerative change of the vascular system; *2.* a new growth of any kind; *3.* syphilitic lesions of the nose, throat and ear, insulin being used as an adjunct.

To me, insulin appears to be the great regulator of metabolism in health, and in disease in which there is faulty metabolism it appears to be a most efficient remedy.

SUMMARY.

1. Insulin in three to five unit doses at stated intervals is of help in combating clinical conditions resulting from a degenerative change in the vascular system.

2. Insulin in three to five unit doses combined with parathormone, calcium lactate and viosterol causes new growths to recede.

3. Insulin in three to five unit doses is a valuable adjunct in the treatment of syphilis.

4. Ulceration of tissue, sclerosis of blood vessels and new growths are favorably influenced by insulin in three to five unit doses at stated intervals.

5. Insulin in three to five unit doses often relieves edema, whether due to obstruction, infection or cardiorenal disease. This suggests its usefulness in edema of the pharynx, uvula, glottis and larynx.

BIBLIOGRAPHY.

1. Brougher, John C.: *Amer. Jour. Physiol.*, April 1, 1927.

2. Davies, Dicken and Dodds: *Biochem. Jour.*, 1926, xx, 695.

3. Grant and Gates: *Proc. Soc. Exp. Biol. and Med.*, 1925, xxll, 315.

4. Behan, R. J.: *Amer. Jour. Surg.*, Aug., 1932, pp. 242-246.

5. Collip: *Jour. A. M. A.*, 1927, 88; 565.

6. Reding: L'equilibre acid-base, cancer et - - pre-cancer. Liege, 1928.

7. Cantarow, A.: Calcium Metabolism and Calcium Therapy. Lea & Ferbeger, p. 148.

THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, INC.

The Forty-first Annual Meeting of the American Laryngological, Rhinological and Otological Society, Inc., will be held in Toronto, Canada, on June 3, 4 and 5, 1935, during the week following the meetings of the American Otological Society, the American Laryngological Association and the American Bronchoscopic Society, in Toronto. The meeting of the American Medical Association will be held in Atlantic City, N. J., during the week following our meeting.

The scientific program is already being prepared and those Fellows who are planning to present papers should so notify the Secretary promptly. Twelve papers will be selected for presentation.

Copies of the *Transactions* for the past five years are available to those Fellows who have not already received them, without cost. Application for them should be made to the Editor of the *Transactions*, Dr. Lyman G. Richards, 319 Longwood avenue, Boston.

Will you please note the change of address of the Secretary, Dr. Robert L. Loughran, Sharon, Conn.

THE CONSERVATIVE TREATMENT OF CHRONIC SUPPURATIVE OTITIS MEDIA. EFFICACY OF IODIN DUSTING POWDER IN THE LOCAL THERAPY.*†

DR. ORAM R. KLINE, Camden, New Jersey.

Chronic suppurative otitis media is manifested by a continuous or intermittent purulent discharge from the middle ear and is the result of an unhealed or recurring acute otitis media.

Whereas, not so many years ago it was the common otological opinion that all otorrheas of this type required radical mastoid surgery, in more recent years we find an increasing number of otologists advocating conservative treatment[1,2] for the relief of this condition unless intracranial or labyrinthine symptoms are present. This method of treatment includes: first, general management of the patient; second, any minor surgery that can be carried out through the external auditory canal to promote drainage and give access to the infected area in the middle ear, and third, meticulous cleansing of the tympanum followed by local medication to the site of infection.

If this treatment fails to definitely improve the condition after it has been persistently and painstakingly carried out, or if at any time symptoms of intracranial or labyrinthine invasion intervene, the classical radical mastoid operation of Stacke or a suitable modification of this procedure should be resorted to in an effort to eradicate necrotic areas and afford adequate drainage.

For more than two years we have been using iodin dusting powder as our antiseptic medication in this treatment; therefore, this paper is largely devoted to the rationale and technique of its use, together with a summary of some of the results obtained.

---

*Read before the Philadelphia Laryngological Society, April 4, 1933.

†Presented as a Candidate's Thesis to the American Laryngol., Rhinol. and Otol. Society.

Editor's Note: This ms. received in Laryngoscope Office and accepted for publication, Jan. 18, 1934.

ETIOLOGY, PATHOLOGY AND DIAGNOSIS.

A brief summary of the etiology, gross pathology and diagnosis of chronic otorrhea is an essential background to an intelligent discussion of the treatment.

Etiology: One of the most frequent causes of the transition from the acute suppurating ear to the chronic state is the failure of the patient and sometimes of the physician to fully appreciate the importance of continuing proper treatment until the ear is dry and remains dry. Adenoids and infections of the nasopharynx often delay cure of the acute inflammation by causing obstruction to drainage and reinfection through the Eustachian tube. The severity of the original infection may produce necrotic areas and thus promote chronicity.

The general resistance of the patient has often been impaired by prolonged faulty diet and hygiene, some chronic constitutional disease or severe acute infection.

There may be weakened and unresistant mucous membrane in the middle ear due to a faulty development. This theory is in accordance with the teachings of Wittmaack in 1918, and more recently emphasized and corroborated by Almour,[3] Kopetzky and others. The tympanum, attic and antrum are at first filled with thick embryonic connective tissue covered by a delicate epithelium. As areation occurs there is an ingrowth of this thick connective tissue into the marrow spaces of the mastoid, followed by a contraction or thinning out, permitting the epithelial covering to develop. The end result or normal development, requiring three to five years, is a complete replacement of all diploic bone by air containing spaces communicating with the antrum. Wittmaack and his corroborators claim that this normal pneumatization is arrested or stopped by any inflammatory condition occurring in the middle ear during this developmental period. If an otitis media occurs in the new born or in infancy before the embryonic tissue has disappeared, the patient remains with a diploetic or sclerotic mastoid and a middle ear and antrum lined with unresistant embryonic tissue instead of normal mucous membrane. If this logical theory is accepted, then arrested mastoid development becomes a definite factor in the etiology of chronic suppurative otitis media.

Gross Pathology: The chronic stage of middle ear suppuration presents various forms and manifold symptoms, depend-

ing upon the pathology present. The history of discharge may vary from several weeks to many years. It may be continuous or intermittent, fetid or odorless, and the amount may be profuse or so scanty as to be imperceptible to the patient.

The can l wall may be thickened by bacterial or fungoid inflammation and may present a fistulous opening into the mastoid.

There may be erosion and necrosis of one or more ossicles, the malleus handle being most frequently involved. The membrana tympani may present various irregularities, such as thickening, thinning, scarring and loss of continuity due to single or multiple perforations. There may or may not be granulations and polypi.

If the perforation is marginal there is an ingrowth of squamous epithelium from the canal wall, which replaces the mucosa with a grayish white covering and a dry ear may result. However, if the drainage is inadequate and the infection persists, the products of desquamation are retained in the middle ear and the so-called cholesteatoma is formed. This mass becomes an added irritant and as it increases in size enlarges the cavity, causing underlying bone absorption.

Since the middle ear consists of the tympanic cavity with its appendages, viz., the Eustachian tube anteriorly and the mastoid antrum with its varying number of communicating cells posteriorly, the site of infection, giving rise to the purulent discharge, must be located in the Eustachian tube, mastoid, walls of the tympanic cavity, ossicular chain or the petrous[4] pyramid cells. In the acute stage the entire middle ear is involved, but the tendency to spontaneous recovery brings about resolution and repair throughout most of the area, localizing and limiting the chronic infection to some particular site.

Diagnosis: A diagnosis of the local pathological condition is attempted by a careful examination of the discharge, granulations, tympanic membrane and necrotic bone areas located by the use of a metal probe. The bacteriological findings in the purulent discharge present the picture of a mixed infection and, therefore, are usually of little significance insofar as the treatment is concerned unless vaccine therapy is to be used. The culture is taken from the middle ear with a sterile

platinum loop passed through a sterile speculum after the external canal and middle ear have been cleansed as thoroughly as possible with alcohol.

The X-ray may aid us in eliminating petrous pyramid suppuration, massive mastoid necrosis, large cholesteatomatous cavitation, malignant disease, tumor or foreign body as a cause of the discharge, but otherwise can give us little information concerning the location of the area of infection.

We should include in our diagnosis the differentiation of those types requiring radical surgery. Those patients presenting symptoms of labyrinthitis, peri-labyrinthitis, meningitis, brain abscess, lateral sinus infection or facial nerve involvement, either twitching or paralysis, require operation as a life saving measure. If an acute exacerbation of a chronic mastoiditis develops, a radical operation is the safest, but not always a necessary procedure. A positive fistula sign may call for operation, but if the infection can be controlled fibrosis may occur and the sign disappear. A fistulous opening in the mastoid cortex or in the posterior bony canal wall usually requires operation, but we have had two in the latter location to become dry with conservative treatment. Petrous pyramid suppuration, if definitely diagnosed, should be drained if the operator has had sufficient experience to successfully perform it. Large cholesteatomatous cavitation not accessible through the tympanum and massive mastoid necrosis must be dealt with surgically if a cure is to be effected. Finally, the present and future residence of the patient is a factor to be considered. If an otologist will not be available to take care of possible acute exacerbations and complications, radical surgery is indicated in many that otherwise would first be treated conservatively.

THE GENERAL MANAGEMENT OF THE PATIENT.

Before local treatment is instituted, the knowledge of the existence of certain constitutional diseases is important, such as diabetes, syphilis, tuberculosis, the anemias and chronic nephritis. In the presence of systemic disease, appropriate general treatment must be carried out in conjunction with any local therapy that is employed.

It has also been demonstrated that the resistance of mucous membranes is definitely lowered by a deficiency in vitamins,

nutritional imbalance of inorganic substances, allergia, and endocrine imbalance. The two former may be adequately handled by proper diet plus indicated medication and the correction of these may in turn markedly improve the symptoms of allergy and endocrine imbalance. Stucky[5] for many years stressed the importance of dietary measures in the treatment of nose and ear diseases. Shurly[6] believes that errors of diet are of prime importance in the loss of endocrine balance and lowered resistance. Dean[7] and Daniels demonstrated, in their experiment with white rats, a marked lowered resistance to infection in the sinuses and mastoid when Vitamin A was withheld from the diet. Later in their normal infant ward they proved the value of proper diet and hygiene in the prophylaxis of sinus and ear infections.

Vitamins A, B and D are of particular value in raising resistance to infection, hence it is advisable to give some concentrated preparation of these vitamins in addition to the diet.

Jarvis[8,9] has recently emphasized the importance of nutritional balance of inorganic substances. He finds that when the diet includes too much acid ash producing food there is an increased reddening of the mucous membrane of the nasal septum; whereas, a pale septal mucous membrane is produced by an excess of alkali ash producing foods. Furthermore, he has shown that when the normal color is restored to the mucous membrane by change of diet, there is a relief from symptoms and increased resistance to infection. These observations of Jarvis have been corroborated by other competent men and some rather surprising results have been obtained in my own practice with this plan of treatment.

Normal resistance may be increased by instructions to the patient concerning exercise, fresh air, sunlight and clothing. Advice as to nose blowing and bathing are of particular value. The nose should be cleansed by blowing with one or both nostrils open, never using sufficient force to produce sensations in the ears. Water entering the middle ear either by way of the Eustachian tube or through a perforation in the membrana tympani is a frequent cause of continued suppuration and recurrences. The head should never be under water and the affected ear should be tightly plugged with lamb's wool whenever there is a possibility of water entering the canal, as in washing the hair, taking a shower bath or when

swimming. In fact, it is much safer to avoid swimming under any conditions.

Associated diseases of the nose and throat must receive adequate treatment. This means the removal of adenoids and infected tonsils, the relief of sinus disease, either by conservative drainage or radical operation, as may be indicated, the correction of septal deformities, if they definitely obstruct nasal breathing or drainage of infected sinuses, and the removal of hyperplastic posterior turbinal tips.

Allergy or human hypersensitiveness is manifested in the nose by hay fever, vasomotor rhinitis, non-suppurative hyperplastic nasal and paranasal sinus disease, edemas and polypi. These nasal disorders of allergic origin call for treatment of the allergic condition in addition to any local measures that may be indicated. H. G. Tobey,[10] Hansel[11] and others have emphasized the importance of correct diagnosis in these patients and have outlined the indicated treatment.

Lewis[12] and Proetz[13] believe that the mucosa of the middle ear presents allergic phenomena similar to those witnessed in the nose and sinuses. This observation seems to further emphasize the importance of including treatment for this condition in our effort to control middle ear infection in allergic patients.

Vaccine therapy[14] has a definite place in the control of chronic ear suppurations. Coates and Ersner[15,16] about 20 years ago proved that in unselected patients either stock or autogenous vaccines would very frequently produce dry ears, the best results being obtained by the use of autogenous preparations. Success with vaccines depends upon the care and technique in taking cultures, the preparation of the vaccine, and the dosage.

LOCAL TREATMENT.

External canal infection: Bacterial infections may be either localized or diffuse. Cotton cones dipped in cresatin or two to ten per cent phenol relieve the pain to some extent. It is my custom to rely upon hot compresses to localize these infections and as a rule permit spontaneous drainage unless there is definite fluctuation. The skin of the canal is at all times kept covered with two per cent yellow oxide of mercury

ointment to guard against reinfection. I have had very little trouble with recurring furunculosis of the canal since using this plan as contrasted with my former practice of early incision. The presence of recurring furunculosis calls for autogenous vaccine therapy in addition to the local treatment.

Otomycosis or fungoid inflammations of the canal usually respond promptly to the removal of all debris, followed by the use of two per cent salicylic acid in 50 per cent alcohol.

Minor surgical procedures to promote drainage from the middle ear: If polypi are present they are removed by the ear snare threaded with silkworm gut. This method is much less painful and safer than using fine wire and is just as efficient. Sharp punch forceps and delicate curettes are employed to eradicate other granulations, followed by the sparing application of 50 per cent silver nitrate to those inaccessible to instruments. The utmost care is exercised to avoid any traction in the removal of granulations, since any pulling action may break down the only existing barrier between the area of infection and the meninges or labyrinth. If the existing perforation is not sufficiently large to permit adequate drainage or the indicated instrumentation, it is enlarged.

Intratympanic surgery: An attempt may be made to close the Eustachian tube by curettement following the Yankauer technique or by the use of a chemical cautery. Fenton[17] advises the use of trichloracetic acid on a curved applicator in the tympanic orifice.

Babbitt[18] has recently advocated an attic drainage operation. Regardless of existing perforations, he makes a large opening in the posterior portion of the membrana tympani. The opening is carried up beneath the scutum and the attic area reamed out by lateral movements of a small right angled probe. Portions of the upper membrane, and scutum if necessary, are punched out to give a free drainage opening. Then an oblique angled curette is passed into the iter ad antrum and its margin curetted free of granulations. The ossicles are not intentionally removed in this operation. Another more radical procedure is ossiculectomy, which consists of the complete removal of all drum membrane remnants, followed by detachment and extraction of the malleus and incus.

SUMMARY OF CASES.

Iodin Dusting Powder Used as the Local Antiseptic.

Case No.	Sex and Age	Date of First Treatment	Otoscopic Findings First Visit	History of Discharge	Dry Ear Obtained	Otoscopic Findings October, 1932	Re-examination June, 1933
1.	M. 20	July 13, 1930	Profuse fetid discharge. Few granulations. Small marginal perforation.	4 years. Recurrent.	Nov. 7, 1930	Dry marginal perforation.	No recurrence.
2.	F. 8	July 22, 1930	Profuse discharge. Massive destruction of ear drum.	5 years. Recurrent.	Persistent mucoid discharge.	Scanty mucoid discharge. Destruction of ear drum.	Unchanged since October, 1932.
3.	M. 23	Oct. 15, 1930	Profuse fetid discharge. Large central perforation.	16 years. Recurrent.	Nov. 28, 1930	Dry central perforation.	Did not report for examination.
4.	F. 32	Nov. 21, 1930	Profuse fetid discharge. Polypi and granulations. Marginal perforation.	10 years. Continuous.	Dec. 5, 1930	Dry marginal perforation.	No recurrence.
5.	M. 44	Dec. 12, 1930	Muco - purulent discharge. Small marginal perforation.	2 years. Recurrent.	Jan. 12, 1931	Dry marginal perforation.	One recurrence promptly controlled.
6.	F. 37	Dec. 26, 1930	Scanty fetid discharge. Few granulations. Small marginal perforation.	6 years. Recurrent.	Feb. 1, 1931	Dry marginal perforation.	Recurrence August, 1932, and June, 1933.
7.	F. 43	Mar. 11, 1931	Moderate fetid discharge. Polypoid granulations. Marginal perforation.	Indefinite History.	Aug. 14, 1931	Scanty mucoid discharge.	Slight recurrence May. 1933—now dry.
8.	F. 49	Apr. 3, 1931	Profuse fetid discharge. Canal filled with polypoid granulations.	40 years. Continuous.	Sept. 28, 1931	No discharge. Complete epidermatization.	No recurrence.
9.	F. 50	Apr. 3 1931	Profuse fetid discharge. Canal filled with polypoid granulations.	45 years. Continuous.	Oct. 20, 1931	Irregular dry scar tissue in middle ear.	No recurrence.
10.	F. 60	June 8, 1931	Somewhat fetid discharge. Small granulation. Marginal perforation.	50 years. Recurrent.	June 25, 1931	Dry marginal perforation.	No recurrence.
11.	M. 18	Aug. 3, 1931	Fetid discharge. Few granulations. Marginal perforation.	13 years. Continuous.	Jan. 23, 1932	No discharge. Drum membrane healed.	No recurrence.
12.	F. 44	Aug. 21, 1931	Fetid discharge. Many granulations. Marginal perforation.	3 years. Recurrent.	Sept. 28, 1931	Dry marginal perforation.	No recurrence.

			Small perforation.				
11.	M. 18	Aug. 3, 1931	Fetid discharge. Few granulations. Marginal perforation.	13 years. Continuous.	Jan. 23, 1932	No discharge. Drum membrane healed.	No recurrence.
12.	F. 44	Aug. 21, 1931	Fetid discharge. Many granulations. Marginal perforation.	3 years. Recurrent.	Sept. 28, 1931	Dry marginal perforation.	No recurrence.
13.	F. 17	Oct. 9, 1931	Profuse fetid discharge. Many granulations. Marginal perforation.	15 years. Continuous.	Nov. 19, 1931	Dry marginal perforation.	No recurrence.
14.	F. 46	Oct. 10, 1931	Considerable fetid discharge. Few granulations. Marginal perforation.	20 years. Continuous.	Jan. 18, 1932	Dry marginal perforation.	No recurrence.
15.	F. 7	Oct. 19, 1931	Profuse fetid discharge. Large marginal perforation.	3 years. Recurrent.	Nov. 20, 1931	Dry marginal perforation.	No recurrence.
16.	F. 51	Oct. 20, 1931	Scanty fetid discharge. Few granulations. Marginal perforation.	43 years. Continuous.	Nov. 3, 1931	Dry marginal perforation.	One recurrence mucoid discharge October, 1932 —now dry.
17.	M. 35	Nov. 5, 1931	Profuse fetid discharge. Large polyp arising from marginal perforation.	12 years. Continuous.	Nov. 28, 1931	Dry marginal perforation.	Did not report for examination.
18.	M. 42	Nov. 14, 1931	Fetid discharge. Few granulations. Marginal perforation.	32 years. Recurrent.	Dec. 22, 1931	Dry marginal perforation.	One persistent recurrence mucoid discharge — now dry.
19.	F. 19	Nov. 30, 1931	Muco-purulent discharge. Few granulations. Marginal perforation.	12 years. Recurrent.	Dec. 21, 1931	Dry marginal perforation.	No recurrence.
20.	M. 25	Jan. 11, 1932	Fetid discharge. Two polypi arising from marginal perforation.	5 years. Continuous.	Jan. 25, 1932	Dry marginal perforation.	One recurrence March, 1933—now dry.
21.	M. 72	Jan. 21, 1932	Profuse fetid discharge. Few granulations. Marginal perforation.	1 year Continuous.	Persistent mucoid discharge.	Scanty mucoid discharge. No granulations. Marginal perforation.	Scanty mucoid discharge. No treatment for 10 months.
22.	M. 23	Feb. 20, 1932	Scanty fetid discharge. Few granulations. Marginal perforation.	Since Infancy. Recurrent.	Feb. 29, 1932	Very scanty, clear, odorless discharge. No granulations.	Did not report for examination.
23.	M. 33	Mar. 9, 1932	Scanty bloody discharge. Pedunculated polyp from marginal perforation.	12 years. Recurrent.	Mar. 14, 1932	Large dry marginal perforation.	No recurrence.
24.	M. 61	Apr. 29, 1932	Muco-purulent discharge from fistula in bony canal wall. Drum intact.	5 years. Continuous.	June 28, 1932	Small dry opening in posterior bony canal wall.	No recurrence.
25.	M. 25	June 6,	Profuse fetid discharge. Ca-	5 years.	Persistent	Fetid discharge less Gran-	Radical

			Drum intact.	ous.		terior bony canal wall.	
25.	M. 35	June 6, 1932	Profuse fetid discharge. Canal filled with polypoid granulations.	5 years. Continuous.	Persistent fetid discharge.	Fetid discharge less. Granulations noted through post. central perforation.	Radical mastoidectomy May, 1933. Now scanty mucoid discharge.
26.	M. 25	June 6, 1932	Scanty fetid discharge. Few granulations. Marginal perforation.	3 years. Recurrent.	June 27, 1932	Dry marginal perforation.	No recurrence.
27.	M. 33	July 1, 1932	Profuse fetid discharge. Granulations in post. Marginal perforation.	14 years. Continuous.	Oct. 1, 1932	Dry large marginal perforation leading into attic. (Oct. 24, 1932.)	Occasional slight mucoid discharge—dry now.
28.	M. 33	July 1, 1932	Profuse fetid discharge. Canal filled with polypoid granulations.	12 years. Continuous.	Persistent fetid discharge.	Fetid discharge less. Granulations noted through marginal perforation.	Residence changed.
29.	M. 20	July 11, 1932	Profuse fetid discharge from attic and fistula in bony canal wall.	Since Infancy. Continuous.	Persistent odorless discharge.	Scanty odorless discharge from attic since August 22, 1932.	Ear dry since Jan., 1933.
30.	M. 34	July 15, 1932	Scanty mucoid discharge. Small posterior marginal perforation.	32 years. Continuous.	Sept. 12, 1932	Dry posterior marginal perforation.	Dry—one recurrence Nov., 1933.

Tobey's[19] intratympanic operation is more extensive. In addition to ossiculectomy he removes the outer attic wall, lateral wall of the aditus and the posterior bony wall of the external auditory canal, thus giving free access to the attic and antrum. The exposed cavity, including the Eustachian tube, is curetted, closure of the latter being attempted by the Yankauer method.

Cleansing of the middle ear: The principle of local therapy, after drainage has been established, is to cleanse both the canal and middle ear cavity as thoroughly as possible in order that the medication, whatsoever it may be, may penetrate to the infected area.

After the larger granulations have been removed, the middle ear is carefully and painstakingly cleansed with small cotton tipped applicators inserted through the perforation. Tenacious discharge and debris can sometimes be more easily dislodged and removed by alternately applying gentle suction and compressed air through a small metal tube curved at the tip. It is probably safer to irrigate the attic with an air current than with fluids, although both methods are used. If cholesteatoma is present, alcohol instillations followed by ether is of considerable aid in breaking it up so that it may more readily be removed. Catheterizing of the Eustachian tube is of value in dislodging debris, particularly that located in the region of the Eustachian orifice.

Local medication: The usual remedial agents used locally may be grouped under instillations, electricity and insufflations.

Instillations may be used by the otologist and also by the patient or some member of the family at home. If used in office practice the cleansing methods already mentioned are carried out. Then the patient is instructed to place the head in a horizontal position with the affected ear upward and the canal is filled with the antiseptic solution which is gently forced into the middle ear by alternately making traction upon the auricle and pressure on the tragus. The solution should remain in the canal for ten minutes.

Very definite instructions should be given concerning the home treatment. If irrigation is desired, when the discharge is profuse, a physiological saline or boric acid solution may be used. Either a douche bag about two feet above the

patient's head or an all-rubber bulb syringe may be safely used if the stream is directed along the meatal walls and care is taken not to interfere with the return flow by blocking the meatus with the irrigator tip. After irrigation the canal should be thoroughly dried by cotton wound applicators and this is usually quite efficiently done if adequate instructions are given. This is followed by instillation of the prescribed solution according to the technic already given. When irrigations are not used the canal is merely cleansed with the cotton wound applicators before instilling the antiseptic.

Some of the antiseptic solutions frequently used as instillations are the following:

Alcohol, 25 to 95 per cent, with or without the addition of boric acid. Ether. Mercurochrome, 2 to 5 per cent. Metaphen, 1:500. Acriflavin neutral, 1:2000. Acriviolet, 1:200.[20] Various silver albuminates, 5 to 25 per cent. Silver nitrate, ½ per cent. Hexylresorcinol. Alcohol (95 per cent) with 1½ per cent each of phenol and tincture of iodin. Calot's solution:[21] Guaiacol, 1. cc.; creosote, 5. cc.; ether, 30. cc.; iodoform ,10. cc.; olive oil, 70. cc.

Stein[22] recently reports very satisfactory results with the use of effervescent tablets of oxyquinolin tartrate placed as near as possible to the infected area.

Pratt[23] uses the dry wick treatment in both acute and chronic otorrheas. The principle of this method is to keep discharge from accumulating in the middle ear by the use of absorbent cotton wicks placed in the canal, one end being in contact with the ear drum. The discharge is drawn from the middle ear by capillary attraction. He advises changing the wick as often as it is half filled with discharge. Since these wicks must be placed in contact with the ear drum to be effective, it seems that considerable difficulty would be encountered in training a member of the family to properly insert them.

There are other solutions indicated by certain infections that are not used as instillations, but applied locally by the physician, such as, emulsion of salvarsan in glycerin for Vincent's infection (fusiform bacillus with Vincent's spirillum), 20 per cent lactic acid in tuberculous manifestations in the middle ear and ethyl hydrocuprein 1 per cent in pneumococcic infections.

The most important contribution of electricity to the local therapy of chronic middle ear suppuration is the introduction of chemical antiseptics in the nascent form by electrical ionization. Zinc is the antiseptic usually employed, although iodin has been used.

Asherson[24] claims zinc ionization will produce dry ears in 95 per cent of patients when the perforation is central and the suppuration is limited to the mucous lining of the tympanic cavity. Success depends chiefly upon properly selecting the cases and thorough cleansing of the middle ear. McLaggen[25] finds that otorrhea is unaffected by ionization when the process cannot "get at the septic spot."

Ionization[26,27,28] is accomplished by first filling the middle ear and external canal with a 1 to 2 per cent zinc sulphate solution and then passing a one to three milliampere electric current through this solution for a period of ten to fifteen minutes. The zinc terminal of the positive pole is so submerged in the solution that it cannot come in contact with the skin or drum membrane, and the negative pole is attached to a moist pad fastened to the arm or leg of the patient. This procedure causes a deposit of zinc in and upon the mucous lining of the middle ear. The treatment may be repeated each week if necessary. There is no home treatment other than cleansing the meatus with dry cotton.

Ultra violet[29] light locally applied through the canal has been used in these chronic infections. It is of particular value as adjunctive treatment in tuberculous patients.

Electricity is also used to shrink and destroy lymphoid tissue in the fossa of Rosenmuller and about the mouth of the Eustachian tube. This is accomplished both by X-ray treatment and electrocoagulation.[30]

Insufflations are applied by means of a powder blower. The antiseptic is delivered through the perforation into the middle ear as a powder after the essential preliminary cleansing has been carried out. A well founded objection to this method of treatment is the obstruction to drainage that is often caused by "caking" of the powder. This disadvantage can, to a great extent, be overcome by using just sufficient powder to dust the exposed surface of the middle ear; however, iodin dusting powder may be used more liberally, as it shows very little of this "caking" tendency.

When insufflations are being used the home treatment is limited to cleansing of the canal with cotton wound applicators, either dry or dipped in alcohol.

Formerly boric acid powder was almost universally employed in this type of treatment, but in recent years iodin dusting powder has become increasingly popular—at least, in some sections. Salol, aristol, iodoform and other antiseptic powders have also been used to some extent in this so-called "dry" treatment.

Iodin dusting powder: a satisfactory local antiseptic: Although successful control of chronic suppurative otitis media by conservative methods depends upon many factors other than the local antiseptic used, we feel that the results obtained by the use of iodin dusting powder justify emphasizing this method of treatment. At the outset, however, it should be understood that neither this nor any other local therapy can be substituted for necessary surgery of the middle ear and mastoid.

This powder was first made and used in 1915, but it was not until 1929 that its therapeutic value was reported to the profession. Beck[31] in July of that year reported "unusually striking results" after six months experience with this treatment, which he stated had been suggested to him by Lederman.[32] This was followed in October by Lederman's report covering fourteen years' experience in which he included twenty-two case histories. The publication of these encouraging and convincing reports served to excite considerable interest in this antiseptic powder.

Harkness,[33] two years later, wrote to twenty representative otologists asking their opinions concerning this method of treatment, but in the opinion of the writer, it stands today enthusiastic. He concludes as follows: "This, of course, does not establish any permanent position for the iodin powder treatment. All reported favorably and many were definitely as the outstanding medicament used in the medical treatment of suppurative otitis media."

The powder: This iodin powder is a patented preparation being made according to N. Sulzberger's original formula. It is not a chemical compound of iodin. It is iodin in a very finely divided condition distributed over boric acid as a car-

rier. Furthermore, the powder is hygroscopic, which is advantageous, for by virtue of this property the secretions of a liquid nature tend to be drawn to the surface. When these aqueous secretions come in contact with the powder the boric acid is dissolved and concomitantly free iodin is distributed in finely divided form, exerting its well known antiseptic properties. The powder is prepared by adding an alcoholic solution of iodin to an alcoholic solution of boric acid. After this solution is freed of alcohol a brownish powder is obtained. The powder with approximately 2 per cent iodin content is the strength most frequently employed and is light brown in color. It should be protected from air and light or iodin is lost by volatilization.

ROUTINE FOLLOWED IN THE SERIES OF CASES SUMMARIZED IN THE ACCOMPANYING TABLE.

In July, 1930, I began to use this powder in office practice and later established it in my dispensary services; however, the cases reported include only private patients upon whom it has been possible to keep a follow-up record.

History: All details that can be recalled about the onset of the disease are noted. Careful questioning will often reveal that the patient dates his running ear from a recurrence or an exacerbation rather than from the time when the infection actually began. The character and amount of the discharge are important as well as the duration. If there have been exacerbations, their frequency and severity should be known, together with the accompanying symptoms. It is also of interest to know the type of treatment that has been tried and its influence upon the symptoms.

Examination: The importance of ascertaining the presence of any constitutional disease has already been mentioned. The nose and throat are examined for any evidence of sinusitis or other chronic infection. The mouth of the Eustachian tube is carefully inspected for adhesions, polypi, hypertrophied lips and neighboring hypertrophied or infected lymphoid tissue. Functional hearing tests are employed to determine the amount of hearing present. While cleansing the canal with cotton wound applicators, the amount, consistency, and odor of the discharge is noted as well as any inflammation of the canal wall. The presence, size, and location of granulations

are observed, and in addition the appearance of the tympanic membrane, if any, is visible. Sometimes it is possible to locate bone necrosis by the use of a metal probe. The X-ray usually shows a sclerosed mastoid, giving us little or no information concerning the site of the infection. A culture and smear of the pus are sometimes of value.

Treatment: The general management of the patient is carried out along the lines already discussed with the exception that vaccines have not been used.

The principle of our local therapy is to remove obstruction to drainage and cleanse the middle ear cavity as thoroughly as possible in order that the iodin powder may penetrate to the infected area. The removal of granulations and polypi when present or the enlargement of a perforation when indicated were the only surgical procedures resorted to in the cases reported.

Cleansing of the canal and middle ear is done according to the technique previously described.

After thorough cleansing has been accomplished, the iodin dusting powder is insufflated through the perforation with a powder blower; also additional powder may safely be permitted to remain in the canal in contact with the perforation, inasmuch as no objectionable hardening or caking of this powder has been noted.

An accessory tube, straight or curved, is sometimes necessary to apply the powder to the site desired. If a metal tube is employed it should be thoroughly cleansed and dried or corrosion will occur. Occassionally patients complain of pain after introduction of the powder; if this is intense or prolonged, subsequent insufflations are preceded by the application of cocain solution to the middle ear. This latter procedure is rarely necessary. The iodin may give rise to a local dermatitis in the canal when the skin is unusually sensitive; however, this seldom occurs and can easily be controlled by protecting the canal with a bland ointment.

It has been my custom to give two treatments each week until the ear is dry and then request the patient to report at increasingly longer intervals in order that any tendency to recurrence may be controlled. Each patient is advised that he has a chronic infection that is possibly only temporarily

arrested and therefore requires further observation. The importance of immediately reporting the return of any symptoms is emphasized and in addition the necessity of having the ear examined at three to six month intervals even in the absence of symptoms.

SUMMARY OF RESULTS.

The results obtained have been very satisfactory as compared to my experience with other antiseptics in the treatment of this disease.

Two of the cases reported still have a fetid discharge, although the appearance of the membrana tympani has much improved. Local treatment will be continued as long as improvement is noted, unless symptoms of intracranial invasion intervene.

Thus far, no intracranial complications have developed in the course of treatment, nor during the subsequent observation period.

The hearing was markedly improved in some, while in others very little change was noted.

Sufficient time has not elapsed to estimate the number of cures obtained. Possibly the apparently cured cases are merely arrested and will later develop recurrences; in fact, there has already been a recurrence of a mucoid, non-fetid discharge in an occasional case, but it has always been promptly controlled by treatment.

In the short series of thirty cases reported, twenty-eight ears are dry or in a satisfactory condition (scanty mucoid discharge); furthermore, the general health of the patients improved as the local infection yielded to treatment.

CONCLUSIONS.

1. Chronic suppurative otitis media is largely a preventable disease. It is the physician's responsibility to follow every case of acute suppuration of the middle ear until the ear remains dry. If the condition does not yield to local treatment, then a mastoidectomy should be done before the chronic state is established, thereby preserving the hearing and preventing serious sequellae.

2. The chronic disease should receive persistent local treatment unless there are urgent symptoms of intracranial or labyrinthine involvement.

3. Constitutional diseases and infections of the nose and pharynx are given the necessary attention.

4. Granulations and polypi are removed, followed by thorough cleansing of the canal and middle ear, so that the medicament used may come in contact with the infected area.

5. It is my opinion that iodin dusting powder is a satisfactory local antiseptic and deserves a definite place in the conservative treatment of chronic suppurative otitis media.

BIBLIOGRAPHY.

1. COATES, GEORGE M.: The Treatment of Chronic Running Ears, or Chronic Suppurative Otitis Media. *Ohio State Med. Jour.*, 1931, xxvii, 128-133.

2. SHAMBAUGH, GEORGE E.: Chronic Suppurative Otitis Media. *Arch. Otolaryng.*, 1930, xii, 753-759.

3. ALMOUR, RALPH: The Significance of the Squamous Epithelium in the Cause and Repair of Chronic Suppurative Otitis Media. *Tr. Amer. Acad. Ophth. and Otolaryng.*, 1930, xxxv, 357-377.

4. KOPETZKY, SAMUEL J., and ALMOUR, RALPH: The Suppuration of the Petrous Pyramid: Pathology, Symptomatology and Surgical Treatment. *Ann. Otol., Rhin. and Laryng.*, 1931, xl, 157-177.

5. STUCKY, J. A.: Deficient Vitamin Diets as a Factor in Otolaryngological Conditions. *Tr. Amer. Laryng., Rhin. and Otol. Soc.*, 1924, xxx, 70-83.

6. SHURLY, BURT R.: Vitamins and Dietetics in Relation to Otolaryngology. *Ann. Otol., Rhin. and Laryng.*, 1928, xxxvii, 251-262.

7. DEAN, L. W.: The Relation of Deficiency Diet to Diseases of the Sinuses. *Ann. Otol., Rhin. and Laryng.*, 1929, xxxviii, 607-611.

8. JARVIS, D. C.: The Upper Respiratory Tract as a Guide to Nutritional Disasters. *Ann. Otol., Rhin. and Laryng.*, 1930, xxxix, 584-592.

9. JARVIS, D. C.: The Pale Nasal Septum Syndrome. *Tr. Amer. Laryng. Assn.*, 1932, liv.

10. TOBEY, H .G.: General Principles of Treatment of Allergic Diseases from Rhinologist's Standpoint. *Tr. Amer. Laryng. Assn.*, 1930, lii, 247-261.

11. HANSEL, FRENCH K.: The Diagnosis and Treatment of Allergic Disease of the Nose and Paranasal Sinuses. *Tr. Amer. Acad. Ophth. and Otolaryng.*, 1930, xxxv, 343-356.

12. LEWIS, E. R.: Allergy and Otitis Media. *Ann. Otol., Rhin. and Laryng.*, 1929, xxxviii, 185-188.

13. PROETZ, A. W.: Allergy in the Middle and the Internal Ear. *Ann. Otol. Rhin. and Laryng.*, 1931, xl, 67-76.

14. FENTON, RALPH A.: Recent Vaccine Therapy in Otolaryngology. *Ann. Otol., Rhin. and Laryng.*, 1927, xxxvi, 387-403.

15. COATES, GEORGE M.: Bacterins in the Treatment of Diseases of the Ear. THE LARYNGOSCOPE, 1914, xxiv, 677-688.

16. COATES, GEORGE M.: The Vaccine Treatment of Suppurative Otitis Media. *Ann. Otol., Rhin. and Laryng.*, 1915, xxiv, 785-799.

17. FENTON, RALPH A.: The Conservative Treatment of Chronic Middle Ear Suppuration. Graduate lecture. *Amer. Acad. Ophth. and Otolaryng.*, 1932.

18. BABBITT, JAMES A.: A Modified Attic Drainage in Chronic Suppurative Otitis Media: Preliminary Report. *Ann. Otol., Rhin. and Laryng.*, 1931, xl, 348-359.

19. TOBEY, GEORGE L., JR.: Treatment of Chronic Suppurative Otitis Media. *Tr. Amer. Laryng., Rhin. and Otol. Soc.*, 1927, xxxiii, 509-516.

20. ABRAHAM, JOSEPH H.: The Use of Gentian and Acriviolet in Infections of the Upper Respiratory Tract and Ear. THE LARYNGSCOPE, 1924, xxxiv, 637-644.

21. GUTTMAN, M. REESE: Chronic Otorrhea. Its Response to Calot's Solution. *Illinois Med. Jour.*, Aug., 1927, lii-2, 143-146.

22. STEIN, SIMON: A New Organic Compound for Use in Chronic Ear Suppuration. THE LARYNGOSCOPE, 1932, xlii, 219-224.

23. PRATT, JOHN A.: Our Eighteenth Century Method of Treating Suppurative Otitis Media. *Jour. A. M. A.*, 1930, xcv, 1258-1260.

24. ASHERSON, N.: Zinc Ionization in the Treatment of Chronic Suppurative Otitis Media. THE LARYNGOSCOPE, 1932, xlii, 141-147.

25. MCLAGGAN, J. D.: The Treatment of Middle Ear Suppuration by Ionization. *The Lancet*, 1929, i, 975-976.

26. FRIEL, A. R.: Statistics of Results of Zinc Ionization in Chronic Otorrhea in Over 600 Cases. *Proc. Roy. Soc. Med.*, 1924-1925, xviii, Sct. Otol., 4-8.

27. LIERLE, D. M., and SAGE, R. A.: Underlying Factors in the Zinc Ionization Treatment of Middle Ear Infections. *Ann. Otol. Rhin. and Laryng.*, 1932, xli, 359-368.

28. TSOONG, A. P. T.: Chronic Otorrhea and its Treatment, with Special Reference to the Use of "Iodin Dusting Powder' 'and "Zinc Ionization." THE LARYNGOSCOPE, 1932, xlii, 34-48.

29. CEMACH, J. A.: Ultra-Violet Therapy in Oto-Rhino-Laryngology. *The Eye, Ear, Nose and Throat Monthly*, 1929, viii, 199-210.

30. HURD, LEE M.: The Use of Surgical Diathermy About the Mouth of the Eustachian Tube for Infection and Catarrh of the Middle Ear. *Ann. Otol., Rhin. and Laryng.*, 1931, xl, 13-18.

31. BECK, J. C.: Nonsurgical Treatment of Chronic Middle Ear Suppuration, Based upon Twenty-five Years Experience. *Ann. Otol., Rhin. and Laryng.*, 1929, xxxviii, 1150-1155.

32. LEDERMAN, M. D.: The Nonsurgical Dry Treatment of Chronic Suppurative Otitis with Iodin Powder (Sulzberger). THE LARYNGOSCOPE, 1930, xl, 397-417.

33. HARKNESS, GORDON F.: Progress in Otolaryngology. Medical and Surgical Treatment. *Ann. Otol., Rhin. and Laryng.*, 1931, xl, 1272-1277.

34. MANESS, GUY: Series of Fifteen Cases of Chronic Otitis Media Treated with Iodin Dusting Powder. THE LARYNGOSCOPE, 1931, xli, 218-220.

414 Cooper Street.

IN MEMORIAM

With regret and sympathy we chronicle the passing of five colleagues in the otolaryngological world:

WENDELL CHRISTOPHER PHILLIPS

1857-1934

Dr. Wendell C. Phillips, President of the American Medical Association in 1926; the American Laryngological, Rhinological and Otological Society, in 1912; the Medical Society of the County of New York, in 1909; the Medical Society of the State of New York, in 1915; Founder and Honorary President of the American Federation of Organizations for the Hard of Hearing, died Nov. 16 at the Manhattan Eye, Ear and Throat Hospital after a brief illness.

Dr. Phillips was born in St. Lawrence County, New York, June 9, 1857; received his medical training in New York; graduated from the Medical Department of the University of New York, in 1882, and practiced in New York City as an otologist for the past half century. He was the author of a textbook on Diseases of the Ear, Nose and Throat and of many articles and monographs pertaining to otology and laryngology.

His unusual executive ability has made him for many years an outstanding figure and influence in the affairs of many important medical organizations. In this capacity he has "urged the medical profession to modify the austerity of its relations with the public and make greater use of the facilities offered by the press and radio in furthering sensible medical education."

He founded the American Federation of Organizations for the Hard of Hearing, in 1919, and was its first president.

Throughout his professional career he was always actively interested in promoting the welfare of the handicapped, and in this field has he made his greatest contributions.

The otological world will sadly miss his experience and wise counsel, his charming personality, his executive ability and his influence for good in all causes in which he was interested.

To his widow, Mrs. Lucia M. Phillips, and his family we extend our deepest sympathy. M. A. G.

CORNELIUS GODFREY COAKLEY

1862-1934

Dr. Cornelius Godfrey Coakley, eminent laryngologist, died of a heart attack at the Presbyterian Hospital, New York, November 23, 1934.

Dr. Coakley was born in Brooklyn, Aug. 14, 1862; graduated from the College of the State of New York, in 1884, and received his Master's Degree there in 1887. That same year he won his M.D. Degree with first honors at University Medical College and for a year served as interne at Bellevue Hospital. He practiced general medicine for a short time and then took up the specialty of nose and throat diseases. He divided his time between active practice, teaching and research work over a period of forty-five years. He remained with New York University until 1896 when he became successively Clinical Professor of Laryngology (1898-1905) and Professor of Laryngology (1905-1914) at University and Bellevue Medical College.

For the past twenty years he was Professor of Laryngology and Otology at the College of Physicians and Surgeons of Columbia University. He was Consulting Laryngologist to the Neurological Institute, Babies' Hospital, Women's Hospital and Sloan Maternity Hospital of the Medical Center; Skin and Cancer Hospital, Southampton Hospital and Seaview Hospital.

On Sept. 10, 1890, he married Miss Annette Perry, of Rochester, N. Y., who died some years later. In August, 1924, he married Miss Mary Louise Perry, a niece of his former wife.

Dr. Coakley was a member of the New York Academy of Medicine, was President of the American Laryngological Association in 1918, a Fellow of the American Medical Association and a member of other medical organizations.

As a substantial foundation to his research work he had been director of the histology department of Loomis Laboratory and lectured in anatomy, as well as instructor in histology at New York University.

His volume, "Diseases of the Nose and Throat," has been largely used as a textbook in medical colleges, was first pub-

lished in 1899 and went through a number of editions. He has contributed substantially to the literature in laryngology.

His counsel and discussions were always respected; his clear, logical mind was applied to many of the problems of laryngology which have demanded solution in the past three or four decades. He was a man of few words, modest bearing, with careful judgment and reliable in his viewpoints.

He is survived by his widow, five sisters and four brothers, to whom we extend our sympathy. M. A. G.

HARMON SMITH

1872-1934

Dr. Harmon Smith, of New York, and his wife, Janet, met a tragic death by suicide in the library of their home on East Sixty-second street, Dec. 11, 1934. No motive for the tragedy seemed to be found beyond the fact that Dr. Smith had been suffering recently from a stomach ailment.

Dr. Smith was born at McDonough, Ga., March 20, 1872, attended the University of Georgia, from which he was graduated in 1892, and Bellevue Hospital Medical College, in New York, where he was a member of the class of 1897. In 1922 he received the honorary degree of D.Sc. from the University of Georgia. He was a former president of the American Laryngological Association and former vice-president of the American Laryngological, Rhinological and Otological Society. For a considerable period in his professional activities he was associated with the late Dr. Jonathan Wright and from this outstanding pathologist in laryngology he acquired much fundamental training for his work. He held many services as a surgeon at the Manhattan Ear, Nose and Throat Hospital and was identified with a number of New York hospitals in the capacity of laryngologist. He was active in promoting the interests of several of the national laryngological associations and served in several official capacities and as a member of their councils. A son, Harmon Smith, Jr., 14 years of age, a student at Chester Military Academy, survives.

M. A. G.

JOHN WALTER CARMACK

1885-1934

Dr. John Walter Carmack, of Indianapolis, was killed Dec. 5 in an airplane accident.

Dr. Carmack was graduated in medicine from Purdue University, in 1907; in 1934 he was Secretary of the Section on Otolaryngology of the American Medical Association. He was Clinical Professor of Otology, Rhinology and Laryngology of Indiana University School of Medicine; a member of the American Academy of Ophthalmology and Otolaryngology, the American Laryngological Association and the American Laryngological, Rhinological and Otological Society, and a Fellow of the American College of Surgons.

In his professional activities, Dr. Carmack was surgeon to the Robert W. Long Hospital, the James Whitcomb Riley Hospital for Children, Indianapolis City, Methodist Episcopal, St. Vincent's and Christian Hospitals in Indianapolis.

Dr. Carmack was esteemed by his colleagues for his affability, kindly spirit, fair-mindedness and high sense of appreciation and courtesy to all with whom he came in contact. As a fellow-member of the various otolaryngological associations he was always co-operative for the best interests and the development of these specialties in surgery. His literary contributions were not numerous but were timely, thoughtful and helpful.

We always appreciated his fine fellowship and shall miss his friendly spirit and wholesome presence.

We extend our expressions of sympathy to his family.

M. A. G.

EDWARD BALDWIN GLEASON

1854-1934

Dr. Edward B. Gleason was born Oct. 13, 1854, in Philadelphia, and died Nov. 30, 1934, at his home in the same bed in which he was born.

Educated in private schools in Philadelphia, he received his Bachelor's Degree in 1875 and his medical degree in 1878. He was the third generation of his family to graduate from

the medical school of the University of Pennsylvania, his father having graduated from there in 1844, and his grandfather in 1807. In 1899, he received his M.D. Degree from the Medical and Chirurgical College; in 1905, Villanova College gave him the honorary degree of LL.B.

Dr. Gleason began the practice of medicine in 1878 and was among the first in Philadelphia to do a mastoid operation.

In 1894, he became Professor of Otology in the Medical and Chirurgical College and when this institution consolidated with the Graduate School of the University of Pennsylvania he continued active both in practice and teaching at this institution until his death.

He was an outstanding teacher, highly esteemed by his many students, was connected with numerous hospitals and clinics in Philadelphia. He was a prolific contributor to medical literature, among his publications being, "The Essentials of Diseases of the Nose and Throat," "A Manual of Diseases of the Nose, Throat and Ear," and "The Essentials of Diseases of the Ear."

He was State's attorney for the Pennsylvania Society, Order of Founders and Patriots; a surgeon in the Medical Reserve Corps with the rank of First Lieutenant. He became a Director of the Aldine Trust Company at its foundation in 1904. He was for years a Director of the Young Republican Club, and at one time was President of the Common Council.

Dr. Gleason was a Fellow of the College of Physicians, a Fellow of the American Academy of Medicine, an honorary member of the Academy of Ophthalmology and Otolaryngology, a member of the Philadelphia County Medical Society, the Pennsylvania Medical Society and the American Medical Association.

In 1888, he married Miss Marion E. Currie, of Ashaway, R. I. They have one daughter, Miss Helen Baldwin Gleason.

Dr. Gleason was descended from Thomas Gleason, who left Northampton, England, to join the members of the Massachusetts Bay Colony in 1636, and was related by descent to two persons who were burned on the Common at Salem in 1699 because it was believed that they were witches.

P. S. S.

BOOK REVIEW.

Clinical Pathology of the Jaws, With a Histologic and Roentgen Study of Practical Cases. By Kurt H. Thoma, D.M.D., and Charles A. Brackett, Professor of Oral Pathology in Harvard University, Oral Surgeon to the Brooks Hospital, Consulting Oral Surgeon to the New England Baptist Hospital, Consulting Oral Surgeon to the Tumor Clinic of the Beth Israel Hospital. 643 pages with 423 illustrations. Published by Charles C. Thomas, Springfield, Illinois, and Baltimore, Maryland. Copyright 1934, by Charles C. Thomas. Price $9.00.

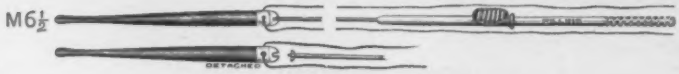
This book represents a complete treatise on malformations, diseases and neoplasms of the jaws. It covers a field of surgery to which relatively little importance has been given, and yet, every physician or dentist, regardless of his specialty, frequently encounters patients presenting lesions of the oral cavity, and should be able to recognize the more common ones and prevent serious delay in instituting proper treatment. This is especially true in cases of malignancy in and about the mouth where it should be possible to make an early diagnosis and institute treatment at a time when such lesions are in a stage in which they can be cured.

A large portion of the book is devoted to the subject of neoplasms, and emphasis has been placed on pathology with excellent illustrations and citations of actual case histories with notes on treatment and results. There is an excellent chapter on infections of the jaws and a brief but thorough discussion of fractures. The question of malformations of the head, face and jaws and of those unusual but important diseases associated with endocrine disturbances, nutritional disturbances and those of uncertain etiology are all well described and discussed.

The entire book is beautifully illustrated with photographs and reproductions of X-ray films with interpretations, and each chapter is followed by an extensive bibliography of articles in many languages. It is a valuable book, which should be familiar to physicians and dentists alike, and the author is to be congratulated on the excellent manner in which he has presented it. W. G. H.

PILLING-MADE INSTRUMENTS

USED BY THE STAFF OF THE CHEVALIER JACKSON CLINICS



ESOPHAGEAL DILATATION

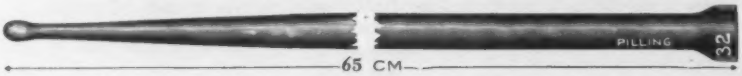
J-2403—M6½. Detachable-stem bougie (the same form as M6, shown Fig. J-2400, page 51, our Bronchoscopic Catalog), but with stem made detachable so the dilator can be left in place for a few hours; it is then withdrawn with the silk string.

See page 359, the new Jackson and Jackson book, Bronchoscopy, Esophagoscopy and Gastroscopy, 1934 Edition, reading as follows:

"The prolonged wearing of our detachable stem dilator (M6½, Fig. 22) enormously increases the efficiency of the endoscopic bouginage and greatly shortens the time required for cure."

Sizes, 20 to 40 French, even numbers.

J-2400—Esophageal Bougie, flexible end, Chevalier Jackson. Sizes, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 and 40 Fr.



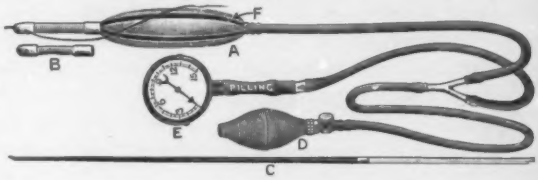
J-2408—Esophageal Bougie, olive tip, web, in sizes 16 Fr. to 40 Fr., even numbers. Length, 65 cm.

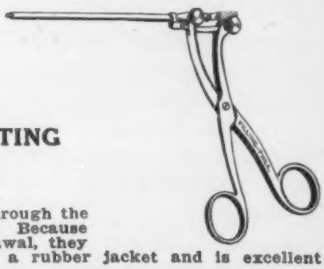
Gabriel Tucker Retrograde Bougies for Retrograde Dilation of Cicatricial Esophageal Stenosis

J-2330—Sizes, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 and 40 Fr.

Cardiospasm Dilators

We make four types of Cardiospasm Dilators, both pneumatic and hydrostatic, after the designs of Drs. Jackson, Mosher, Tucker, Imperatori and Plummer. The one illustrated herewith is of the Mosher type with barium (X-Ray) strips in the bag; the dial is luminous.





EXPANSILE WITH-DRAWAL DILATING FORCEPS

Chevalier Jackson, M.D., Philadelphia

J-1756—F34. These instruments are introduced through the stricture closed, then expanded and withdrawn. Because all of the dilatation is accomplished on withdrawal, they are quite safe in careful hands. Covered with a rubber jacket and is excellent for either bronchial or esophageal stricture.

THE GEORGE P. & SON CO. **PILLING** ARCH & 23RD STS., PHILA., PA.

JAN 14 1935

INDEX NUMBER

Vol. XLIV DECEMBER, 1934 No. 12

MEDICAL LIBRARY

THE LARYNGOSCOPE

AN INTERNATIONAL MONTHLY JOURNAL
DEVOTED TO DISEASES OF THE

EAR - NOSE - THROAT

FOUNDED IN 1896 BY

DR. MAX A. GOLDSTEIN
Managing Editor and Publisher.

COLLABORATORS:

Dr. ALBERT A. GRAY, Glasgow;
Dr. CHEVALIER JACKSON, Philadelphia;
Dr. F. LASAGNA, Parma;
Dr. M. D. LEDERMAN, New York;
Dr. HARRIS PEYTON MOSHER, Boston;
Dr. FRANCIS R. PACKARD, Philadelphia;
Sir ST. CLAIR THOMSON, London;
Dr. W. A. WELLS, Washington, D.C.

For Contents See Page 1.

Subscription, $6.00 per Annum, in Advance.

Foreign Subscription, 35 Shillings per Annum, Post Free.
Single Copies, 75 cents.

PUBLISHED BY THE LARYNGOSCOPE CO.

4574 West Papin Street St. Louis, Mo., U.S.A.

FOREIGN OFFICE, BAILLIERE, TINDALL & COX
7 & 8 HENRIETTA ST., COVENT GARDEN, LONDON, ENG.

[Entered at the Postoffice at St. Louis, Mo., as Second Class Matter, in July, 1896.]

Mail Your Order Now!

PROBLEMS OF THE DEAF

BY

MAX A. GOLDSTEIN, M.D., F.A.C.S.

610 Pages—273 Illustrations—Leather Bound

$6.00 Postage Prepaid

An unusual, authoritative and comprehensive volumn of XIX chapters, covering every phase of work with the Deaf and Deafened and Speech Defective, by an otologist and teacher of 40 years' experience, including:

Chronological History of Deafness — Anatomy and Physiology — Mechanics of Speech — Speech Defects — Cerebral Localization — Hearing Tests — Methods of Instruction — The Acoustic Method — Training of Teachers — The Deaf Child — Hard-of-Hearing Child — Physician and Deaf Child — Parent of Deaf Child — Deafened Adult — Hearing Aids — Schools for the Deaf — Quacks and Quackeries — Research.

Published by **THE LARYNGOSCOPE PRESS**

4574 West Papin Street **ST. LOUIS, MO.**

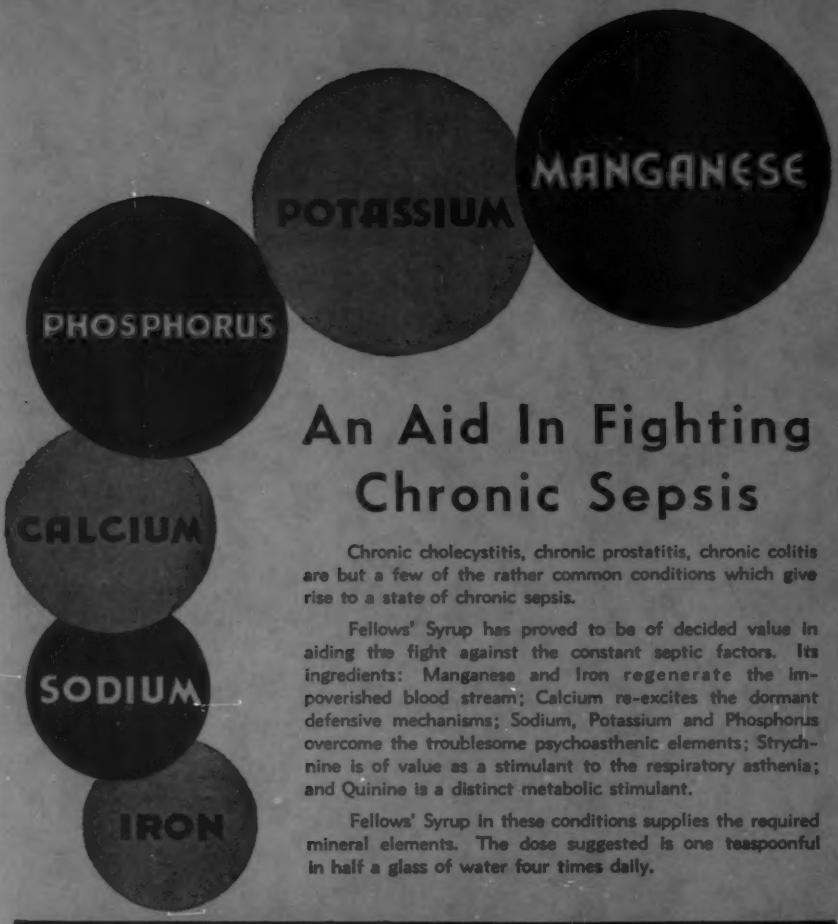
THE LARYNGOSCOPE PRESS,
4574 West Papin Street,
St. Louis, Mo.

Enclosed please find check for $.....for.....copies of "PROBLEMS OF THE DEAF" by MAX A. GOLDSTEIN, M.D., F.A.C.S.

NAME .....

STREET .....

City..... State.....



An Aid In Fighting Chronic Sepsis

Chronic cholecystitis, chronic prostatitis, chronic colitis are but a few of the rather common conditions which give rise to a state of chronic sepsis.

Fellows' Syrup has proved to be of decided value in aiding the fight against the constant septic factors. Its ingredients: Manganese and Iron regenerate the impoverished blood stream; Calcium re-excites the dormant defensive mechanisms; Sodium, Potassium and Phosphorus overcome the troublesome psychoasthenic elements; Strychnine is of value as a stimulant to the respiratory asthenia; and Quinine is a distinct metabolic stimulant.

Fellows' Syrup in these conditions supplies the required mineral elements. The dose suggested is one teaspoonful in half a glass of water four times daily.

FELLOWS' SYRUP

SAMPLES ON REQUEST

FELLOWS MEDICAL MFG. CO., INC.

26 Christopher Street, New York, N.Y.

PILLING TRACHEOTOMY CANNULA SERVICE

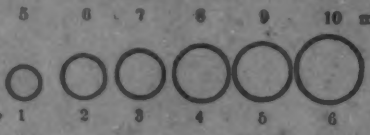
Because of our stock and manufacturing facilities we can promise immediate delivery. You cannot afford to wait.

CHEVALIER JACKSON TRACHEOTOMY CANNULA

Tracheotomy Cannula, Chevalier Jackson, full curve, regular sizes, 1 to 6, sterling silver, with pilot $7.00
Same, plated $4.25
Tracheotomy Cannula, Chevalier Jackson, cane shape, regular sizes, 1 to 6, sterling silver, with pilot $10.00
Same, plated $5.50

SUGGESTED SIZES FOR TRACHEAL CANNULAE BY DR. CHEVALIER JACKSON

These sizes all leave a by-passage in the trachea for air, so that a cannula (except after total laryngectomy) should never be so large as to fit closely in the trachea.



New-born infant	No. 1
Up to 1 year	No. 1
1 to 3 years	No. 2
3 to 6 years	No. 3
6 to 12 years	No. 4
12 to 20 years	No. 5
Adult (women)	No. 5
Adult (men)	No. 5 or 6

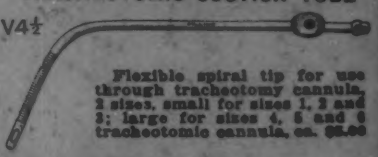
CHEVALIER JACKSON MODIFIED TRACHEAL DILATOR

Correctly shaped, light in weight, not cumbersome. Sizes, regular and infant, each $4.50.

CHEVALIER JACKSON TRACHEOTOMY CANNULA, Larger Sizes

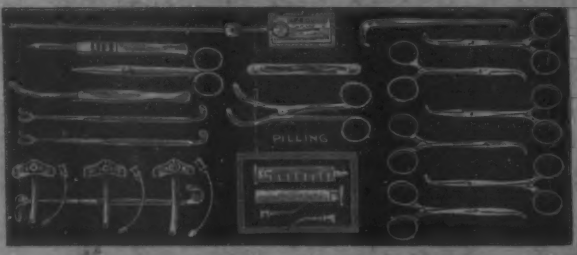
Tracheotomy Cannula, Chevalier Jackson, full curve, sizes 7, 8 or 9, sterling silver, with pilot $9.00

TRACHEOTOMIC SUCTION TUBE



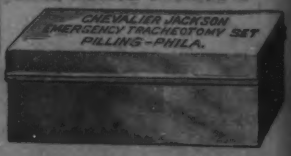
Flexible spiral tip for use through tracheotomy cannula, 2 sizes, small for sizes 1, 2 and 3; large for sizes 4, 5 and 6 tracheotomic cannula, ea. $2.00

EVERY DOCTOR SHOULD HAVE ACCESS TO THIS EMERGENCY TRACHEOTOMY SET OF CHEVALIER JACKSON INSTRUMENTS



Complete set of tracheotomy instruments safely protected in a copper case wrapped in a sterile towel and ready for immediate use; is almost indispensable—it saves time and removes all doubt. Instruments are carefully patterned after the Chevalier Jackson Tracheotomy models, and include aspirating tubes, retractors, hemostats, tracheal dilator, scalpel, blunt bistoury, dissecting scissors, thymus retractor, tenaculum, suture needles, catgut and syringe.

With 2 plated tubes $55.00
With 1 silver tube $42.50



THE GEORGE P. PILLING & SON CO. — ARCH & 23D STS., PHILA., PA.